Twentieth annual report of the Wisconsin Dairymen's Association : held at Oshkosh, Wis., February 10, 11 and 12, 1892. Report of the proceedings, annual address of the president, and interesting essay...

Wisconsin Dairymen's Association
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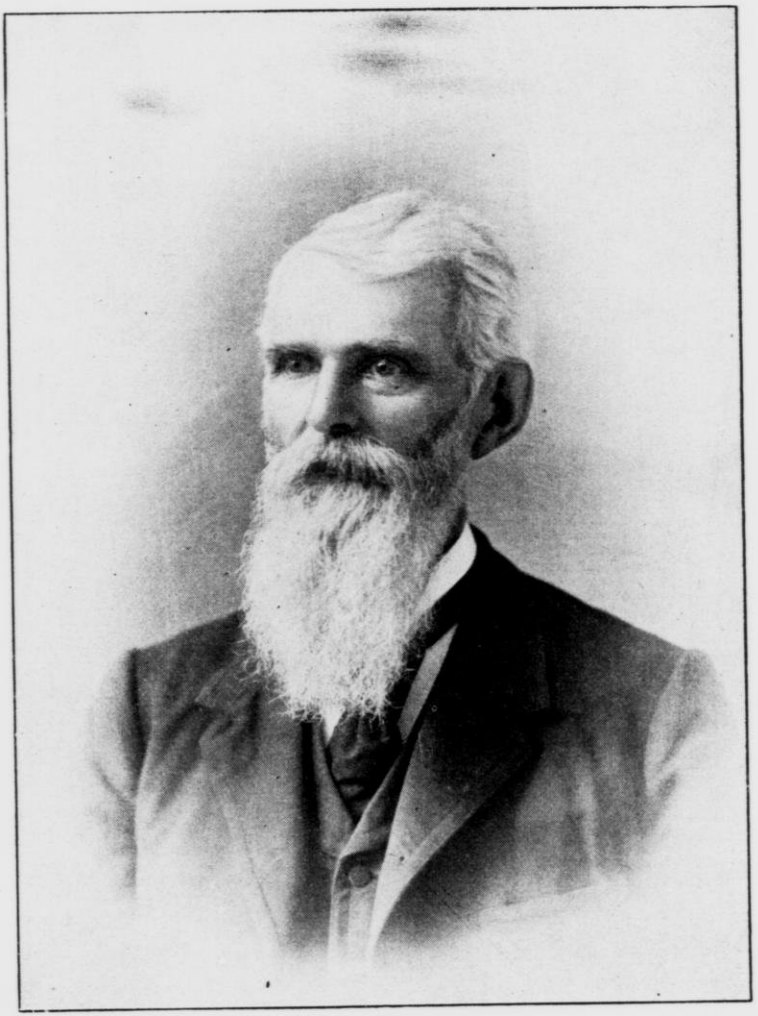

STEPHEN FAVILL,

Ex-President Wisconsin Dairymen's Association.

TWENTIETH ANNUAL REPORT

OF THE

WISCONSIN

DAIRYMEN'S ASSOCIATION,

HELD AT

Oshkosh, Wis., February 10, 11 and 12, 1892.

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, WISCONSIN
DEMOCRAT PRINTING COMPANY, STATE PRINTERS.
1892.

LETTER OF TRANSMITTAL.

OFFICE OF THE SECRETARY,
Wisconsin Dairymen's Association,
FORT ATKINSON, April 20, 1892.

To His Excellency, GEO. W. PECK,
Governor of the State of Wisconsin:

I have the honor to submit the twentieth 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 Oshkosh, Winnebago county.

Respectfully submitted,
D. W. CURTIS,
Secretary.

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OFFICERS, 1892.

PRESIDENT.

Ex.-Gov. W. D. HOARD,

Fort Atkinson, Jefferson County.

VICE PRESIDENTS.

Hon. CHESTER HAZEN, Ladoga, Fond du Lac County.
President Wisconsin Dairymen's Association from 1872–4.

Hon. HIRAM SMITH, Sheboygan Falls, Sheboygan County.
President Wisconsin Dairyman's Association from 1875–6.

Hon. A. DeLAND, Sheboygan Falls, Sheboygan County.
President Wisconsin Dairymen's Association, 1877.

Hon. H. F. DOUSMAN, Waterville, Waukesha County.
President Wisconsin Dairymen's Association, 1878.

Hon. Z. G. SIMMONS, Kenosha, Kenosha County.
President Wisconsin Dairymen's Association, 1879.

Hon. STEPHEN FAVILL, Delavan, Walworth 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, Madison, Dane County.
President Wisconsin Dairymen's Association from 1883–6.

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.

Secretary.

D. W. CURTIS,

Fort Atkinson, Jefferson County.

TREASURER.

H. K. LOOMIS,

Sheboygan Falls, Sheboygan County.

ARTICLES OF ASSOCIATION.

Adopted February 15, 1872.

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

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

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

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

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

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

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

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

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

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

MEMBERS FOR 1892.

Adams, H. C., Madison.
Aderhold, E. L., New London.
Albright, J. G., Oshkosh.
Allen, Dr., Oshkosh.
Allen, Mrs. N. E., Beaver Dam.
Allen & Weidner, Oshkosh.
Angell, C. E., Oshkosh.
Angus, O. J., Oshkosh.
Angus & Humphrey, Oshkosh.
Arnold, F. C., Oshkosh.
Athern & Son, Oshkosh.

Banderob & Chase, Oshkosh.
Barber Bros., Oshkosh.
Bauman, Geo., Oshkosh.
Baumgartner, J., Oshkosh.
Beach, C. R., Whitewater.
Bender, John, Oconomowoc.
Bernstein, D. M., Oshkosh.
Binghim, A. M., Jessup, Iowa.
Blisset & Hallock, Oshkosh.
Boardman, C. R., Oshkosh.
Bormann, H., Oshkosh.
Boss, Christian, Clemansville.
Bouck, Gabe, Oshkosh.
Bowles, Thos., Elo.
Boyd, John, Chicago, Ill.
Boyd, R. M., Racine.
Brand, R., Oshkosh.
Breed, Geo. D., Chilton.
Bridge & Son, Oshkosh.
Bristol, F. J., Oakfield.
Brow, O. L., Oshkosh.
Brown, R. C., Oshkosh.
Buchanan, E., Hebron, Ill.
Buckstaff, D. C., Oshkosh.
Burchard, Geo. W., Ft. Atkinson.
Burns, A., Oshkosh.
Byers, W. H., ——, Canada.

Calkins, W. G., Winneconne.
Campbell, D. M., Oshkosh.
Cease, C., Fairwater.
Charboneau, P., Oshkosh.
Chase, O. F., Oshkosh.
Chisholm, H., Oshkosh.
Choate, L., Oshkosh.
Churchyard, Mrs. H., Ripon.
Clagget, F. B., Oshkosh.
Clark, J. G., Oshkosh.
Clark, J. J., Berlin.
Cleveland, Judge, Oshkosh.
Clum, H. A., Oshkosh.
Coffin, Wm., Oshkosh.
Conlee Lumber Co., Oshkosh.
Conroy, J. L., Oshkosh.
Cowham, James M., Eldorado.
Crane, E. M., Oshkosh.
Crawford, J. H., Oshkosh.
Curtis, Chas., Oshkosh.
Curtis, D. W., Ft Atkinson.
Curtis, F. C., Rocky Run.

Daly, Thos., Oshkosh.
D rrow; A. H., Brandon.
Davis, J. C., Oshkosh.
Decker, J. A., Madison.
Decker, J. F. W., Oshkosh.
Dennison, T. O., Mason City, Iowa.
Derksen & Peck, Oshkosh.
Dichman, Wm., Oshkosh.
Dimpsey' L., Oshkosh.
Dolliver, J. F., Rodney.
Doughty, W., Oshkosh.

Eastman, C. D., Plymouth.
Eastman, Geo., Oshkosh.
Eckstein, S., Oshkosh.
Edgarton, B. L., Oshkosh.
Englebright, W. H., Oshkosh.
Ernst, Conrad, Oshkosh.
Evanson, John, West McHenry, Ill.
Everett, C. H., Beloit.

Faber, Wm., Oshkosh.
Finney, Ed., Oshkosh.
Foster, C., Oshkosh.
Frentz, Theo., Oshkosh.
Froelich, J. A., Oshkosh.

Gillen Bros., Oshkosh.
Goodrich, C. P., Fort Atkinson.
Grandine, J. B., Sherwood.
Green, M. B., Oshkosh.
Grim, Nic., Oshkosh.
Gudden, J. H., Oshkosh.
Gurler, H. B., DeKalb, Ill.

Haase & Son, Oshkosh.
Haines, John, Oshkosh.

Hallock, S. W., Oshkosh.
Hammen, Peter, Beechwood.
Hansen, P., Oshkosh.
Harkness, D. L., Berlin.
Harmon, H. M., Oshkosh.
Harmon, L. D., Oshkosh.
Harrington, John, Oshkosh.
Harris, D. W., Oshkosh.
Harshaw & Skinner, Oshkosh.
Hay, S. M., Oshkosh.
Hay, W. H., Oshkosh.
Hay, W. J., Oshkosh.
Heath, Wm., Oshkosh.
Hennig, Chas., Oshkosh.
Henry, E. D., Oshkosh.
Henry, W. A., Madison.
Herman & Ernst, Oshkosh.
Heyman, S., Oshkosh.
High, John, Berlin.
Hill, Wm., Oshkosh.
Hoard, A. R., Fort Atkinson.
Hoard, W. D., Fort Atkinson.
Hobart, H. A., Oshkosh.
Hoernig, Chas., Oshkosh.
Holm & Atkins, Oshkosh
Holmes, John, Oshkosh.
Hooper & Hooper, Oshkosh.
Horn, E. A., Oshkosh.
Hough & Topliff, Oshkosh.
Howard, Geo., Brushville.
Hughes, Mrs. C. L. C., Oshkosh.
Houston, R. S., Ranney.

Ihrig, J. J., Oshkosh.
Ingalls, S. M., Fond du Lac.

Jackson, E., Oshkosh.
Johnson, C. A., Oshkosh.
Johnson, Wm. M., Oshkosh.
Jones, D. B., Oshkosh.
Jones, F. R., Hancock.
Jones, Morris, Oshkosh.
Jones, W. F., Lake Mills.
Josslyn, F. H., Oshkosh.

Kaudy, C., Oshkosh.
Kelly, J. T., Oshkosh.
Kennedy & Son, Oshkosh.
Kezertee, Dr. I., Oshkosh.
Kimball, W. W., Oshkosh.
King, F. B., Oshkosh.
King, F. H., Madison.
Kirkland, R. B., Jefferson.
Kleish Bros., Potter.
Kloeckner, J., Oshkosh.
Kone, A. C., Oshkosh.
Konrad, W., Oshkosh.
Kraby, Carl, Oshkosh.
Kramer, Math., Charlesburg.
Krippene, H., Oshkosh.
Kuehmsted, A. O., Oshkosh.

Laabs, Otto, Oshkosh.
Laabs & Rosenkranz, Oshkosh.
Lampert, F., Oshkosh.
Lampert, M., Oshkosh.
Lawson, D., Oshkosh.
Lichtenberger, A., Oshkosh.
Lockwood, G. M., Oshkosh.
Luhm, Mrs. E., Oshkosh
Luscher, G. S., Oshkosh.
Luscher, Wm. D., Oshkosh.
Lyman & Frees, Oshkosh.
Lyon, G. W., Brandon.

McBride, Quincy, Burton, Mich.
McCorrison, O., Oshkosh.
McKoy, H. W., Oshkosh.
March & Bucholz, Oshkosh.
Maulick & Kitz, Oshkosh.
Meentzen, John, Oshkosh.
Merrill, J. H., Oshkosh.
Merrill, P. H., Omro.
Metz & Schloerb, Oshkosh.
Miracle, Chas., Oshkosh.
Monrad, J. H., Ninretka, Ill.
Morgan, Wm., Oshkosh.
Morrison, W. H., Madison.
Munger, Milo, Harvard, Ill.

Nash, H. C., Oshkosh.
Neville, T. A., Oshkosh.
Noyes, A. F., Beaver Dam.
Noyes, H. J., Richland City.

Odell, R. H., 869 Racine St., Milwaukee.
Oertel, M., Oshkosh.
Oleson, Ole, Oshkosh.
O'Rourke, J., Oshkosh.
Osborn, J. H., Oshkosh.
Oviatt, Dr. A. E., Oshkosh.
Oviatt, Dr. C. W., Oshkosh.
Owens, Edwin, Wild Rose.

Palmer, S., Oshkosh.
Peckard, H. L. W., Neenah.
Peffer, Miss Kate F., Pewaukee.
Percy, Frank, Oshkosh.
Perkins, A., Milwaukee.
Peterson, J., Oshkosh.
Phillips, M. C., Oshkosh.
Porter, J. H., Oshkosh.
Potter & Sprague, Oshkosh.

Quartermas, W. W., Oshkosh.

Radford, Chas., Oshkosh.
Rang, Wm., Oshkosh.
Rasmussen, J. P., Oshkosh.
Rawson, G. H., Beloit.
Read, Benj., Oshkosh.
Reneking, F. C., Bungert.

Rich, W. A., Oshkosh.
Roberts, I. P., Ithaca, N. Y.
Roe, G. W., Oshkosh.
Roe & Co. D. H. Chicago Ills.
Roenitz, H. C., Oshkosh.
Rogers, Chas, Oshkosh.
Rogers, C. S., Oshkosh.
Rogers, Com., Oshkosh.
Rowlands, John, Portage.
Rudd E. Co., Oshkosh.
Russell, R. C., Oshkosh.
Ryan, Thos., Oshkosh.

Sampson, B. E., Oakfield.
Schein, C., Oshkosh.
Scherck Bros., Oshkosh.
Schild & Wunderlich, Oshkosh.
Schloerb & Shickendantz, Oshkosh.
Schmidt, J. F. W., Oshkosh.
Schmidt & Luther, Oshkosh.
Schmidt Trunk Co., Oshkosh.
Schneider J., Oshkosh.
Schribner, F. H., Rosendale.
Schribner & Blackburn, Oshkosh.
Siewert, F. W., Oshkosh.
Siewert & Cole, Oshkosh.
Simmons, A. P., Oshkosh.
Smith, Clinton D., St. Anthony Park, Minn.
Smith, C. R., Zion.
Smith, E., Rolling Prairie.
Smith, Geo. W., Burnett Junction.
Sowles, L. W., Omro.
Spaulding, T., Oshkosh.
Spink, R. A., Oshkosh.
Steele, Dr. G. M., Oshkosh.
Stein, Chas., Oshkosh.
Stelter, G., Fairwater.
Stevens, Jas., Oshkosh.
Stewart, F. C., Oshkosh.
Strauss & Jandorf, Oshkosh.
Stroud, Chas., Oshkosh.

Theilen, F., Oshkosh.
Thompson, G. W., Rosendale.
Thorp, C., Burnett Junction.
Tupper, A. C., Osage, Iowa.
Tuttle Bros., Oshkosh.

Van Liew, W. D., Oshkosh.
Voigt, C. F., Oshkosh.
Voss, H. W., Oshkosh.

Wahle & Stein, Oshkosh.
Wakeman, Jr., Wm., Oshkosh.
Washburn, G. W., Oshkosh.
Washburn, John R., Oshkosh.
Waukesha Dairy & Produce Co., Waukesha.
Webb & Rundle, Oshkosh.
Weber Bros., Oshkosh.
Weed, H. I., Oshkosh.
Weeks, H. S., Oconomowoc.
Weisbrodt, Capt., Oshkosh.
Wendorff, J. F., Oshkosh.
West, H. P., Fayettville.
Whitemore, H., Brandon.
Williams, M. J., Oshkosh.
Williams, W. R. Oshkosh.
Wittke, Robt., Beaver Dam.
Witzel, Daniel, Oshkosh.
Witzel, M., Oshkosh.
Worden, F. E., Oshkosh.
Wyland & Cassel, Oshkosh.
Wyman & Cardiff, Oshkosh.

Zentner, Fred., Oshkosh.

TWENTIETH ANNUAL MEETING

OF THE

WISCONSIN DAIRYMAN'S ASSOCIATION.

Oshkosh, Wis., Wednesday, Thursday and Friday, February 10, 11, 12, '92.

PROGRAM.

MORNING SESSION, FEB. 10.

10:30 A. M. President Hoard will call the Association to order. The first session will be devoted to the organization of the Convention, announcements and five minute talks on appropriate topics until the hour of adjournment.

AFTERNOON SESSION.

2:00 P. M. Address of Welcome, by his Honor, Mayor Dichman of Oshkosh.

Response by Hon. H. C. Adams, of Madison.

The Annual Address by the President of the Association, Ex-Gov. Hoard.

Management of a Dairy Farm, C. R. Beach, Whitewater, Wis.

How to Cheapen the Cost of Food for Cows, H. S. Weeks, Oconomowoc, Wis.

Observations among the Milk Producors, D. L. Harkness, Dairy and Food Commissioner, Madison, Wis.

What should be our Judgment and Practice for 1892, According to Modern Light? A. C. Tupper, Dairy Commissioner, for Iowa.

Wisconsin Dairy Products at the Columbian Exposition, R. B. Kirkland, Esq., Executive Commmissioner for Wisconsin, Jefferson, Wis.

COMMITTEE ON AGRICULTURE.

State Board of World's Fair Managers:

J. M. Coburn, West Salem, Wis.

Hugh H. Price, Black River Falls, Wis.

Wm. Rohr, Manitowoc, Wis.

How to Estimate the Value of Manure, Prof. W. A. Henry, Director Wisconsin Experimental Station, Madison, Wis.

How to Save and Apply Manure, Prof. I. P. Roberts, Director Cornell University Experimental Station, Ithaca, N. Y.

Construction and Ventilation of Dairy Barns, Prof. F. H. King, Experimental Station, Madison, Wis.

The different Values of Milk and How to Determine them by the Babcock Test, Gen. George W. Burchard, Fort Atkinson, Wis.

Is it Practical to Apportion Dividends to Patrons of Creameries by the Babcock Test? H. B. Gurler, De Kalb, Ill.

The Results of Paying Patrons According to the Butter Value of their Milk, A. R. Hoard, Fort Atkinson, Wis., Manager Hoard's Creameries.

Creamery Experience in Iowa in 1891, T. O. Dennison, President Iowa Dairymen's Association, Mason City, Iowa.

Creamery Management, Judge G. W. WASHBURN, Oshkosh, Wis.

What is Meant by Ripening Cream? Are the best Results Obtained by the Present Method? JOHN BOYD, Elmhurst, Ill.

The City Milk Trade, HON. H. C. ADAMS, Madison, Wis.

How to Make Butter on the Farm, C. P. GOODRICH, Fort Atkinson, Wis.

Salting Butter, F. C. CURTIS, Rocky Run, Wis.

Management of Cheese Factories, O. J. ANGUS, Oskhosh, Wis.

Working for Yield in Cheese Making, HON. CHARLES D. EASTMAN, Plymouth, Wis.

Cheese Making the Year Round, H. J. NOYES, Richland City, Wis.

The last part of the session will be devoted to the discussion of questions placed in the Question Drawer. This is an intensely practical part of the exercises and no one farmer or dairyman should fail to attend. Every farmer who wishes any question discussed should write it out and present it, or send the same to the secretary.

Banquet Thursday evening.

BUTTER AND CHEESE.

The Association offers the following premiums on Wisconsin dairy products:

Class I.— Dairy Butter.— Firsts.

Ninety-four (94) points or over must be awarded to secure First Premium.
First premium.. $9.00 Second premium.. $7.00 Third premium.. $5.00

Class II.— Dairy Butter.— Seconds.

Ninety-one (91) points or over must be awarded to secure First Premium.
First premium.. $7.00 Second premium.. $5.00 Third premium.. $3.00

Class III.— Creamery Butter.— Firsts.

Ninety-four (94) points or over must be awarded to secure First Premium.
First premium.. $9.00 Second premium.. $7.00 Third premium.. $5.00

Class IV.— Creamery Butter.— Seconds.

Ninety one (91) points or over must be awarded to secure First Premium.
First premium.. $7.00 Second premium.. $5.00 Third premium.. $3.00

Class V.— Print Butter.

Not less than three pounds made into prints.
First premium.. $5.00 Second premium.. $3.00 Third premium.. $1.50

Class VI.— Cheese.— Firsts.

Cheddars, Flats or Young Americas.

Ninety-four (94) points or over must be awarded to secure first premium.
First premium.. $9 00 Second premium.. $7.00 Third premium.. $5.00

Class VII.— Cheese.— Seconds.

Cheddars, Flats or Young Americas.

Ninety-one (91) points or over must be awarded to secure first premium.
First premium.. $7.00 Second premium.. $5.00 Third premium.. $3.00

Class VIII.— Silver cup.— Special for cheese.

Geo. S. Hart & Co., produce commission merchants, 38 Pearl street, 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.

OFFERED BY THE BUSINESS MEN OF OSHKOSH.

No entry is required for the specials as they are additional premiums to the regular list.

Class I.— Dairy butter.—Firsts.

Class 1, First Premium, Wm. Dichmann, Grocer, 5 lb. can baking powder $2 25
Class 1, First Premium, M. Lampert & Co., Boots and Shoes, pair ladies' shoes..... 5 00
Class 1, Second Premium, E. R. Jones, Dry Goods, ladies' muff..... 3 00
Class 1, 2d and 3d Premiums, Hicks Printing Co., Pub. Northwestern, 2 subscriptions to the Weekly Northwestern for 1892..... 2 50

Class II.— Dairy butter.— Seconds.

Class 2. First premiums, Bauman & Co., Druggists, jewel casket.... $2 50
Class 2, First Premium, Evans Bros., Grocers, 5 pounds tea..... 3 00
Class 2, First Premium, A. Kuemsted, Clothier, silk plush cap..... 3 00
Class 2, Second Premium, J. A. Froelich, Druggist, toilet set..... 5 00
Class 2, Third Premium, Angus & Humphrey, Wholesale Dealers in Cheese and Dairy Implements, box picnic cheese 3 00

Class III.— Creamery butter.— Firsts.

Class 3, First Premium, Wyman & Cardiff, Gents' Furnishers, pair gloves $2 50
Class 3, First Premium, J. F. W. Decker, Crockery and Glass-ware, cut glass ware 3 00
Class 3, First Premium, F. H. Josslyn, Dry Goods, suit underwear.. 3 00
Class 3, Second Premium, J. E. Holden & Co., Dry Goods, rug.... 3 00
Class 3, Third Premium, L. Strauss & Co , Boots & Shoes, pair slippers 2 50
Class 3, Lowest Score, Clark's Syndicate, Dry Goods, 1,600 page hymn book..... 3 00

Class IV.—Creamery Butter.—Seconds.

Class 4, First Premium, Weber Bros., Dry Goods, Chenille square... $2 50
Class 4, First Premium, S. M. Hay & Bro , Hardware, 3 dairy pails 2 00
Class 4, Second Premium, E. A. Horn, Druggist, album..... 3 50
Class 4, Third Premium, Hull & Hawthorn, Fancy Goods, lamp.... 2 50

Class V.—Print Butter.

Class 5, First Premium, Stroud Music Co., violin..... $15 00
Class 5, Second Premium, Birely & Son, Jewelers, castor..... 3 50
Class 5, Third Premium, N. Simon & Co., Wholesale Cheese Dealers, Neenah, cheese..... 3 00

Class VI.--Cheese.—Firsts.

Class 6, First Premium, R. B. Anger & Co., Jewelers, clock	$2 50
Class 6, First Premium, Church Bros., Fancy Foods, album	3 75
Class 6, First Premium, K. M. Hutchinson, Hardware, ½ doz. milk pans	2 00
Class 6, Second Premium, B. H. Soper, Furniture, picture	5 00
Class 6, Third Premium, Mehlmann Bros., Cigar Makers, box cigars	3 00

Class VII.—Cheese.— Seconds.

Class 7, First Premium, Wm. Spikes, Furniture, chair	$9 00
Class 7, Second Premium, O. McCorrison, Furniture, carpet sweeper	2 00
Class 7, Second Premium, John Hurn, Bookseller, set Maccauley's history	2 50
Class 7, Third Premium, Hough & Topliff, Dry Goods, Brussels rug	3 00

BUTTER AND CHEESE EXHIBIT.

RULES.

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 5.

3. Scale of points for judging butter: Flavor 55. Grain 20 Color 15. Salting 10. Total 100.

4. Scale of points for judging cheese: Flavor 40. Texture or buttery Stock 40. Color 10. Salting 5. General make-up 5. Total 100.

5. No package can compete for more than one premium, only as specials are awarded.

6. Butter and cheese may be shipped by express, CHARGES MUST BE PREPAID, WITH NAME AND ADDRESS ON EACH PACKAGE, to H. K. LOOMIS, Oshkosh, Wis.

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

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.

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

Chapter 452, *Laws of* 1889.

SECTION 1. 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.

SECTION 2. 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 necessary and actual expenses incurred in the discharge of their official duties.

SECTION 3. It shall be the duty of the commissioner to enforce all laws that now exist, or 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 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 of this state.

SECTION 4. Said commissioner or any assistant shall have power in the performance of his official duties to enter 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 commis-ioner 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 commissioner or any of his assistants by refusing to allow him entrance to any place where 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.

SECTION 5. 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.

SECTION 6. 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 report 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.

SECTION 7. The salaries of the commissioners 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.

SECTION 8. 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 analysis, 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.

SECTION 9. Said commissioner shall be furnished a suitable office in the capitol, at Madison, and shall make an annual 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, annually as other official reports are published, and of which five thousand copies shall be bound in cloth.

SECTION 10. All acts and parts of acts conflicting with this act are hereby repealed.

SECTION 11. This act shall take effect and be in force from and after its passage and publication.

Approved April 16, 1889.

Note to section 4, supra.— 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 if 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 testify. 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 and 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

had analyzed some which was proven to have been sold by the defendant, is admissible. *Commonwealth v. Holt*, 146 Mass., 38.

PURE MILK, STANDARD OF.

Chapter 425, *Laws of* 1889.

SECTION 1. 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.

SECTION 2. In all prosecutions or other proceedings under this or any other law of this state relating to the sale or furnishing 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 or unskimmed, contain less than three per centum of pure butter fat, when subjected to chemical analysis or other satisfactory test, or that it had 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 disease or ulcers or other running sores, then and in either case the said milk shall be held, deemed and adjudged to have been unmerchantable and adulterated, impure or unwholesome, as the case may be.

SECTION 3. All acts and parts of acts conflicting with or contrary to the provisions of this act are hereby repealed.

SECTION 4. This act shall take effect and be in force from and after its passage and publication.

Approved April 16, 1889.

NOTE — Validity. — A New York law (chapter 183, of 1885; chapter 202, of 1884), provides 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." *Held* a valid exercise of legislative power. *People vs. West*, 106 N. Y., 293.

A statute is not invalid because it fixes an arbitrary standard for pure or unadulterated milk, though it is drawn from healthy cows, and is sold in its natural state. *In People vs. Clipperly*, 37 Hun. (N. Y.), 324, it was held otherwise, one judge dissenting.

On appeal this case was reversed, without opinion, on the grounds given in the dissenting opinion: 101 N. Y. 634. The supreme court of New Hampshire say on this question: 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 such as is constitutional. *State vs. Campbell*, 13 Atl. Rep., 585.

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, those facts are matter of a defense, and their existence need not be negatived on the face of the indictment. *People vs. 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 vs. Schaffner*, 16 Northeast. Rep., 280.

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 vs. Holt*, 15 Northeast. Rep., 280.

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 upon 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 vs. Rowell*, 15 Northeast. Rep., 154.

Effect of the act of 1889 upon previous laws.— It seems reasonably clear that section 1, of chapter 425, laws of 1889, *supra*, supersedes section 1, of chapter 157, laws of 1887, as to the offense of selling diluted, impure and unclean milk. Both the acts referred to cover the provisions of section 4607 Revised Statutes, and hence that section is not in force.

PROOF OF ADULTERATION, HOW MADE.

Section 2, of Chapter 157 of the Laws of 1887, as amended by Chapter 344, Laws of 1889.

SECTION 1. 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.

SECTION 2. This act shall take effect and be in force from and after its passage and publication.

Approved April 10, 1889.

NOTE.— This act supersedes chapter 361, laws of 1885, so far as the last mentioned act is valid. The act of 1885 prohibited the manufacture out of any oleaginous substances, or any compound of the same, other than that produced from unadulterated milk, or cream of the same, any article designed to take the place of butter or cheese, produced from pure, unadulterated milk, or cream of the same, and the offering of the same for sale or selling it as an article of food, without providing, as does the act of 1889, that the sale or offering for sale such an article must be made as and for butter or cheese, the product of the dairy. See, to the effect that such a clause is unconstitutional, *People vs. Arensberg*, 103 N. Y., 388.

NOTE.— **Origin.**— This section, except as to the penalty, is a copy of a part of section 8, chapter 183, laws of New York, 1885.

Validity.— Section 7, chapter 183, laws of New York, 1885, "prohibits: 1st. The manufacture out of any animal fat, or animal or vegetable oils not produced from unadulterated milk or cream from the same, of any product in imitation or semblance or designed to take the place of natural butter produced from milk, etc. 2d. Mixing, compounding with, or adding to milk, cream or butter, any acids or other deleterious substances, or animal fats, etc., with design or intent to produce any article in imitation or semblance of natural butter. 3d. Selling, or keeping or offering for sale any article manufactured in violation of the provisions of this section." *Held*, that if butter made from animal fat or oils is as wholesome and nutritous and suitable for food as dairy butter, the producers of butter made from animal fat or oils have no constitutional right to resort to devices for the purpose of making their products resemble in appearance the more expensive article known as dairy butter. It is competent for the legislature to enact laws to prevent the simulated article being put upon the market in such a form and manner as to be calculated to deceive. The statute is intended to reach a designed and purposed imitation of dairy butter in manufacturing the product which is not such butter, and not a resemblance in qualities inherent in the articles and common to both kinds of butter. *People vs. Arensberg*, 105 N. Y., 123.

A state may lawfully prohibit the manufacture out of oleaginous substances, or out of any of its compounds, other than that produced from unadulterated milk or cream from such milk, of an article designed to take the place of butter or cheese produced from unadulterated milk. It may also prohibit the manufacture, or sale, or the offering for sale, of any imitation or adulterated butter or cheese, or the having of it in possession with intent to sell the same as an article of food. *Powell vs. Pennsylvania*, 127 U. S., 678.

Though it may be severe to punish those who unintentionally sell the article prohibited, the legislature has power to so provide in order that the much larger number may be protected. *State vs. Newton*, 14 Atl. Rep., 604.

The supreme court of New Jersey has held that a statute enacted for a purpose similar to that which caused the passage of this act is not invalid because it prohibits the sale of oleomargarine brought to that state from other states and not intended for further transportation. The act produces only an indirect and incidental effect upon interstate commerce. *State vs. Newton*, 14 Atl. Rep., 604.

ADULTERATED HONEY MUST BE MARKED.

Part of Chapter 40, *Laws of* 1881.

SECTION 2. 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 1 of this act.

NOTE.—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.

SECTION 4. 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.

SECTION 5. One-half of all the fines imposed by the enforcement of this act shall be paid to the person who informs against and prosecutes such offender to conviction.

SECTION 6. All acts or parts of acts conflicting with the provisions of this act are hereby repealed.

SECTION 7. This act shall take effect and be in force from and after its passage and publication.

Approved March 3, 1881.

PENALTY FOR THE SALE OF UNWHOLESOME PROVISIONS.

Section 4599, *Revised Statutes.*

SECTION 4599. Any person who shall knowingly sell any kind of diseased, corrupt 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.

ADULTERATION OF FOOD, LIQUORS AND CANDIES.

Section 4600, *Revised Statutes.*

SECTION 4600. 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 injurius 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.

NOTE.—See chapter 248, law of 1879, *infra*, which appears to supersede this section in part.

ADULTERATION OF FOOD AND DRUGS—DECEPTIVE LABELING OF.

Chapter 248, *Laws of* 1879.

SECTION 1. 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.

SECTION 2. 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 effect 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 sections 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.

SECTION 3. 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.

SECTION 4. 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.

SECTION 5. This act shall take effect and be in force from and after the first day of July, after its passage and publication.

Approved March 5, 1879.

ADULTERATION OF DRUGS AND MEDICINES.

Section 4601, *Revised Statutes.*

SECTION 4601. 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.

NOTE.— See chapter 248, laws of 1879, *supra.*

COLORING GRAIN.

Section 4606, *Revised Statutes.*

SECTION 4606. 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 anv 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.

OF THE ANALYSIS OF FOODS, DRUGS AND DRINK.

Chapter 252, *Laws of* 1880.

SECTION 1. 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.

SECTION 2. The state board of health and vital statistics, medical officers of health, inspectors of weights and measures, boards of supervisors of any town, board 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, 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.

SECTION 3. 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 in 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 had in all the courts of this state as prima facie evidence of the properties of the articles analyzed by him.

SECTION 4. 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.

SECTION 5. 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 analyzed and by whom submitted.

SECTION 6. 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.

SECTION 7. This act shall take effect and be in force from and after its passage and publication.

Approved March 15, 1880.

THE PREVENTION OF FRAUD IN DAIRY MANUFACTORIES.

Section 1494*a*, *Revised Statutes.*

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 manufacture), 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 the number cut or otherwise disposed of, and the weight of each, shall, for each and every offense, forfeit and pay a sum of not less than twenty-five dollars, nor more than one hun-

dred 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.

TEXT AND SUGGESTIONS RELATING TO THE LAW PASSED BY THE LEGISLATURE OF 1891.

This act repeals Chap. 240, *Laws of* 1887, *as amended by Chap.* 455, *Laws of* 1889.

SECTION 1. Chapter 455 of the Laws of 1889 is hereby repealed.

SECTION 2. Every person who shall, at any cheese factory in the state, manufacture cheese, shall distinctly and durably stamp upon each and every such cheese, whether cheddar, twin, flat or Young America, or by whatever name or style known, upon the sale thereof, in full faced capital letters, the grade of the same, as, "Wisconsin full cream," "standard," or "skimmed," as hereafter provided for in this act, together with the name of the city, village or town where such factory shall be located.

SECTION 3. Such cheese only as shall have been manufactured from pure and wholesome milk, and from which no portion of the butter fat shall have been removed by skimming or by any other process, and in the manufacture of which neither butter nor any substitute for butter or other animal or vegetable fats or oils have been used, nor any fat which has been extracted from milk in any form and returned for the purpose of filling the cheese, shall be stamped "Wisconsin full cream." All cheese manufactured as above required from pure and wholesome milk, but from which a portion of the fat has been removed, shall if it contain not less than thirty per centum of pure butter fat, be stamped or branded "standard." All cheese containing less than thirty per centum of pure butter fat shall be stamped "skimmed."

SECTION 4. The stamp provided for in this act designating the grade of cheese shall be such as to produce an impression not less than three inches in width and five inches in length, and the words "Wisconsin full cream," "standard," or "skimmed," together with the name of the city, village or town where the cheese shall have been manufactured, as provided for in the foregoing sections of this act, shall be in full faced capital letters of as large a 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, purple 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 in this act

SECTION 5. Any manufacturer of cheese who shall sell or dispose of any cheese without being stamped as required by this act, or who shall falsely stamp the same, and any dealer or other person who shall remove such stamp from cheese, shall, upon conviction thereof, be fined not less than fifty nor more than one hundred dollars for the first offense, and for each subsequent offense not less than one hundred nor more than two hundred dollars or be imprisoned in the county jail not less than thirty nor more than ninety days, or both, in the discretion of the court before whom such conviction may be had. One-half of all the fines collected under the provisions of this act shall be paid to the person or persons furnishing the information upon which such conviction is procured.

SECTION 6. Nothing in this act shall be construed to apply to edam, brickstein, pineapple, limburger, Swiss or hand cheese, or other cheese by whatever name or style known not made by the ordinary cheddar process.

SECTION 7. All acts or parts of acts inconsistent with the provisions of this act are hereby repealed.

SECTION 8. This act shall take effect and be in force from and after its passage and publication.

There are three distinctive brands under the law quoted.

No. 1, Full Cream Cheese.

WISCONSIN

FULL CREAM CHEESE

Fond du Lac, Wis.

All cheese made by the cheddar process and made from milk from which no fat has been taken, shall bear brand No. 1.

No. 2, Standard Cheese.

STANDARD CHEESE

Fond du Lac, Wis.

All cheese made by the cheddar process, and made from milk from which any fat has been taken, but still leaving not less than thirty per cent. of fat in the cheese shall bear brand No. 2.

No. 3, Skimmed Cheese.

SKIMMED CHEESE

Fond du Lac, Wis.

All cheese made by the cheddar process, and made from milk from which enough fat has been taken so that the cheese is left with less than thirty per cent. of fat, shall bear brand No. 3.

The law provides that the stamp or brand shall be not less than three by five inches, and inclosed by a plain heavy border. The ink shall be indelible, so that it will not rub off. The brand or stamp is to be placed upon the bandage of the cheese. A rubber stamp costs about the same as a stencil and does much better work.

The name of the manufacturer cannot be placed inside the border. If the maker wishes his name to appear, it can be placed on the cheese anywhere except within the impression.

The law of 1889, which provided for marking the box, is repealed.

Rubber stamp manufacturers are in possession of this law, and you can be provided with stamps by any of them. The firm from which you buy your supplies, can furnish you the necessary stamps.

Filling cheese with foreign fat is prohibited by chapter 424, laws of 1889.

Enriching skim milk with butter is prohibited by chapter 264, laws of 1891, also by chapter 165, laws of 1891.

TO THE WISCONSIN DEALERS AND MANUFACTURERS OF VINEGAR.

Text and suggestions relating to the law passed by the legislature of 1891.

SECTION 1. 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.

SECTION 2. 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.

SECTION 3. 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.

SECTION 4. 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.

SECTION 5. 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.

SECTION 6. This act shall take effect and be in force from and after its passage and publication.

Section 1 provides that any person who makes cider vinegar shall sell it as such.

Section 2 provides that no injurious ingredients shall be used in the manufacture of vinegar.

Section 3 provides that no person or his agent, shall sell adulterated or spirit vinegar as cider vinegar.

Section 4 provides that all vinegar shall test not less than 4 per cent. of acetic acid, and that cider vinegar shall contain not less than two per cent. of solids, and that manufacturers and reducers, and persons who handle vinegar, shall brand upon the head of barrel, in letters not less than one inch, the per centum of acetic acid, as follows:

ACETIC ACID 4 PER CENTUM.

Chapter 248, Laws of 1879, provides that no label, mark or device shall be upon any package or cask, which shall mislead or deceive as to the true contents.

The law relating to the branding of casks will be enforced on and after June 1st, 1891.

THIS ACT REPEALS CHAPTER 185, LAWS OF 1887.

SECTION 1. No person shall sell, exchange, expose or offer for sale or exchange, or ship or consign, or have in his possession with intent to sell, ship or consign any substance purporting, appearing, or represented to be butter or cheese, or having the semblance of either butter or cheese, which substance is not made wholly and directly from pure milk or cream, salt and harmless coloring matter, unless it be done under its true name, and each vessel, package, roll or parcel of such substance has distinctly and durably painted, stamped, stenciled or marked thereon the true name of such substance in ordinary bold-faced capital letters, not less than five line pica in size, or sell or dispose of in any manner to another, any such substance in quantities less than the original package, without delivering with each amount sold or disposed of, a label, on which is plainly and legibly printed in ordinary bold-faced capital letter not less than five line pica in size, the true name of such substance.

SECTION 2. No person or persons shall manufacture out of any oleaginous substance or substances, or any compound of the same other than that produced wholly, directly and at the time of manufacture from unadulterated milk or cream, salt and harmless coloring matter, any article in imitation of or designed to be sold, shipped or consigned as butter or cheese. Nothing in this section shall prevent the use of pure skimmed milk in the manufacture of cheese; but cheese made wholly or in part from skimmed milk should be plainly labeled, "skimmed."

(*This section repeals chapter* 424, *laws of* 1889.)

SECTION 3. No person or persons shall manufacture, mix, compound with or add to natural or pure milk, cream, butter or cheese, any animal fats, animal, mineral or vegetable oils, or extreneous butter fat or oil, nor shall any person or persons manufacture any oleaginous or other substance not produced wholly and at the time from pure milk or cream, salt and harmless coloring matter, or have the same in his possession with intent to offer or expose the same for sale or exchange, or sell, consign, ship, or in any manner dispose of the same as and for butter or cheese, nor shall any substance or compound so made be sold or disposed of to any one as and for butter or cheese.

SECTION 4. No person or persons shall sell, exchange, expose or offer for sale or exchange, dispose of, ship or consign or have in his possession any

substance or article made in imitation or resemblance of any dairy product which is falsely branded, stenciled, labeled or marked.

SECTION 5. Every person in this state who shall deal in, keep for sale, expose or offer for sale or exchange, any substance other than butter or cheese, made wholly and directly from pure milk or cream, salt and harmless coloring matter, which appears to be, resembles or is made in imitation of, butter or cheese, shall keep a card, not less in size than ten by fourteen inches, posted in a conspicuous and visible place, where the same may be easily seen and read, in the store room, stand, booth, wagon or place where such substance is so kept or exposed for sale, on which card shall be printed on a white ground, in bold, black Roman letters, not less in size than twelve line pica, the words, "oleomargerine," "butterine," or "imitation cheese" (as the case may be) "sold here," and said card shall not contain any other words than the ones above prescribed; and no person shall sell any oleomargarine, butterine, imitation cheese or other imitation dairy product, at retail or in any quantity less than the original package, tub or firkin, unless he shall first inform the purchaser that the substance is not butter or cheese, but an imitation of the same.

SECTION 6. Every proprietor, keeper or manager, or person in charge of any hotel, boarding house, restaurant, eating house, lunch counter, or lunch room, who therein sells, uses or disposes of any substance which appears to be, resembles, or is made in imitation of butter or cheese, under whatsoever name, and which substance is not wholly and directly made from pure milk or cream, salt and harmless coloring matter, shall display and keep a card posted in a conspicuous place, where the same may be easily seen and read, in the dining room, eating room, lunch room, restaurant and place where such substance is sold, used or disposed of, which card shall be white, and in size not less than ten by fourteen inches, upon which shall be printed in plain, black, Roman letters, not less in size than twelve line pica, the words "oleomargarine used here," "butterine used here," or "imitation cheese used here," (as the case may be) and said card shall not contain any other words than the ones above prescribed, and such proprietor, keeper, manager or person in charge shall not sell, furnish or dispose of substance as and for "butter or cheese" made from pure milk or cream, salt and harmless coloring matter, when butter or cheese is asked for.

SECTION 7. 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.

SECTION 8. 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.

SECTION 9. 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.

SECTION 10. All acts or parts of acts controvening the provisions of this act are hereby repealed.

SECTION 11. This act shall take effect and be in force from and after its passage and publication.

TRANSACTIONS,

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS,

OF THE

WISCONSIN DAIRYMEN'S ASSOCIATION,

AT THEIR TWENTIETH ANNUAL CONVENTION,

Held at City Hall, Oshkosh, Winnebago Co., Wis., Feb. 10, 11, 12, 1892.

The Twentieth annual convention of the Wisconsin Dairymen's Association convened at the City Hall, at 10:30 A. M. Wednesday, February 10th, 1892. President Hoard in the chair.

The Chairman — Our first session this morning will be devoted to the organization of the convention, announcements and five minute talks on appropriate topics. The Chair will take occasion to say that it is very much gratified to see so many present at this our first meeting. The Wisconsin Dairymen's Association was organized twenty years ago this month. Your humble servant sent out a call asking for all men interested in dairying to meet at Watertown and form a state association. Six men met and laid the egg that has had this mighty hatching. It is a very healthy chicken and seems to be able to do a good deal of very intelligent and useful scratching.

Mr. Stephen Favill — Crowing you mean?

The Chairman — It is entitled to crow. We have been passing around over the state traveling here and there for our annual meetings, holding them in sections where dairy thought, dairy judgment and dairy practice had not been as thoroughly ad-

vanced as in some other sections, and we have seen the most evident good results. To illustrate, a few years ago this convention went to Arcadia, way up among the sand hills, near the northwestern portion of the state. It was a new thing to the judgment and comprehension of the farmers of that section, but we went at it, we had a strong force of dairy workers with us, and we had a good meeting. Now, that section of the state is among the most prosperous in its dairy work; factories and creameries have sprung up and a manifest improvement all along the line in the management of cattle, and in all that constitutes dairy intelligence is seen.

There was an old farmer down east who had quite a flock of sheep, and he had a lot of barren knolls all around on his farm, and he made a practice of herding those sheep on the barren knolls at night. He would build a fence around a knoll and collect all the sheep inside of it and keep them there a few nights, and then he would take them to another one, and he finally succeeded in pretty well fertilizing his farm. Now, this association has been going around the state fertilizing the judgment of the people of the state on this question. Now, my friends, we do not intend to formally open this meeting until this afternoon, but we want to hear from some of the old war horses who are here, and have some short talks. The first president of our association, Chester Hazen, is with us, and we would like to hear how things are going in his part of the country. We want to get warmed up. Down in Vermont where I have been this winter when they have a sleigh ride party they tumble into a sleigh altogether, and they say, "Lay the brands close together if you want a good fire." That is what we want to do.

Mr. Morrison — It has always been a mooted question in the southern part of this state whether it was Chester Hazen who built the first cheese factory in the state of Wisconsin or organized the first string band.

Mr. Hazen — Mr. President, and brother dairymen, the string band business I don't know much about, but I do know that I was one of the first dairymen in the state. I put a dairy on my farm where I live now in 1850, and I have kept a dairy

there from that time to the present. Fond du Lac County, I guess, was one of the leading counties in dairy interests for a long time, and we thought some of us who were interested in those days that by organizing we could concentrate the matter. In the summer of 1864, I built a cheese factory on the American cheese factory plan and had the milk of about 150 cows. In 1868, I think, we organized what we called the Fond du Lac County Dairymen's Association. A gentleman, named H. C. Strong, was the secretary, and I was the president of it. In 1872, as our president says, he issued a call for those interested in dairy pursuits to meet in Watertown, and I met there with five or six others, and we organized a state association. We dropped our county association at that time, and merged it into the state association. I was the first president, and Hoard was the secretary and it is gratifying to meet in our gatherings year by year and see the progress that has been made. Our first meeting went pretty hard; we had to pull very strong to get up an interest and make the meeting go, but we had one gentleman among us who could always get up some kind of interest, so we could at least get some fun out of it, and that gentleman occupies the chair at the present time. Hiram Smith attended our first meeting, and from that time on, we continued to progress until in 1876 we made an exhibit at the Centennial, which was our first opportunity to exhibit Wisconsin dairy products in competition with other states. We got our share of the premiums there, and it put us on a level with the other states. Not long after that we got an appropriation from the state, and that helped us, because we had before that been obliged to put our hands in our pockets and pay expenses. I don't know but that the association ought to pay Bro. Hoard something for printing he did in those days that he never got paid for. He has done a great deal of work for the association. This is the twentieth meeting of this association and I have missed but one, and it is very gratifying to me as one of the organizers to see the success that we have made and the bright prospects before us for the future.

The Chairman — There is in the audience, Mr. W. H. Gilbert, ex-president of the New York state dairymen's association, one

of the prime butter-makers of the state, one of the instructors in butter-making in the dairy school, and a gentleman who is always ready to give a reason for the hope that is within him, and we would like to have him say a few words with reference to the progress of dairy education in New York.

W. H. Gilbert, of New York — I want to congratulate the dairymen of Wisconsin at being at the head of the procession.

While I am from a state which is probably the largest dairy state in the union and manufactures the most product, at the same time I might as well own up that the Wisconsin dairymen have the start of us. We have been doing good work for the last four or five years and we are looking forward to taking our place in the front ranks. We are making a little more money, but better still, we are making better products and we acknowledge that we are getting a good many lessons from you.

Our New York dairymen's association has adopted a new system, For the last six years we have been holding an itinerant dairy school, or rather several of them. The first was held on my farm several years ago. Secretary Schull wrote me, asking me to hold a butter school in some section of the state. He said he and President Lewis had talked the matter over and wanted to know if I would hold the school. I answered that I thought it was a good thing, and that if they would come to my place that I would furnish the material, the place for holding the meeting and the labor. All I would ask of them would be to bring the instructor.

Notices were sent out and arrangements were made with Professor Arnold to give a practical illustration in manufacturing butter. As it happened Mr. Arnold was sick and could not come, but Secretary Schull and President Lewis came to our place and there were about five hundred people there. The meeting was held in a grove and it was a very hot day. Mr. Lewis was not able to do the work, and I told them that I would go on and make the butter just as I was in the habit of doing it on my farm.

That is the first dairy school ever held in the state and met with perfect success. We had two churnings there in the heat

and it was very well done and it was a very practical illustration.

Then the topics of feeding and caring for cows were brought up for discussion, and we had two very interesting sessions.

The next year the state association held six meetings in different parts of the state, giving practical illustrations and modes of working in the manufacture of butter, the care and feeding of cows and also suggesting methods of testing cows.

The next year we held fifty, and from that time we have been holding what we call those itinerant schools. For instance, we go into some back place and hold the school where considerable instruction is needed, and we will have an average of from fifty to sixty attendants or students, as we call them, for four days.

We can see the good results of this work in our butter schools in many ways. The dairy interests in the state have increased, they are using better methods, taking better care of their cows, and even in the butter market we can see the influence of these butter schools.

They have, of course, regular schools at Cornell, where they have a line of instruction in butter and cheese making, but they have not had and could not have very many students of the class reached by the itinerant schools.

I could relate many instances of the results as shown in different parts of the state; for instance, I went to Hillside, Columbia county, this last summer and found very substantial results of a school held there two years ago. I found one gentleman who had been making a series of very valuable tests which I think were afterwards printed in Hoard's Dairyman. The improvements in this man's methods, and the results of selection following tests, were shown in the fact that his herd of sixteen cows, six of which were two-year-old heifers with their first calves, had produced between eleven and twelve hundred dollars, and as he told me it was entirely owing to the following out of the suggestions received from our itinerant butter school.

That kind of work has been going on through our state, and we feel pretty confident that if you Wisconsin people do not get ahead of us on this line, we can hope to get into the first rank.

As I have said, we have a good many new ideas from Wis-

consin. Wisconsin has given us the Babcock milk test, and a good many ideas that have come from your experimental station. We are getting the benefit of the good work that is done in this state, and whatever work we have done, that will do you any good, we shall be glad to give you, because after all, our interests are identical.

The Chairman — A practical illustration of the value of education. As I believe I have said before, we may have the best cream in the world, if we don't agitate it, we never will get any butter out of it. We may have the best thoughts and the best ideas, if we don't agitate them the community sees no result from them. We have with us, and would like to hear from, the Hon. B. E. Sampson, of Dodge county, a member of the last legislature and a most doughty champion of the dairy.

Mr. B. E. Sampson — I am not a scientific dairyman, but I am glad to say I was able to help through our last legislature a measure that I think was appreciated by the dairymen. One thing I discovered in regard to law making, anything connected with the farm, and that is, that as soon as dairy matters come up, there seems in the legislature a more united standing together of members than perhaps in legislation in any other direction. I attribute that to the organization of the dairymen throughout the state, and further, to the work that has been done. The large amount of wealth that has come into the state through the dairy interest, we cannot help but recognize, and it is a matter in which there are no party lines drawn. The legislature in power did a great deal of work for the dairy. Last winter we made a large appropriation to build up a dairy school on the university ground and the instruction in that school and in the short course in dairying is doing a vast amount of good. I know I went to Prof. Henry last winter and engaged a buttermaker for our factory and we got better butter than we ever got before, butter that sold way up at the top of the market. The dairy education going on in this state is something that we should be proud of; it is building up the state in every direction, and I know of no other way in which the state can be more substantially built up. Gentlemen, I didn't come here to talk myself. I came here to hear men talk about dairying,

from whom I can learn something myself. I keep a few cows and I try to keep them fairly well, and I am interested in the subject.

The Chairman — I notice this morning with us Mr. H. B. Gurler, of Illinois, late dairy teacher in the dairy school at Vermont, and a former president of the Illinois association. Will Mr. Gurler tell us how he found things in Vermont?

Mr. H. B. Gurler — Mr. President and Gentlemen: When I first went to Vermont, I had a little fear that I would be antagonized on account of being a western man, going from the west where we are infants to where they were grown up. Dairying was not born in the west when Vermont was way to the front. But I am happy to say that I did not strike one bit of that. I found when I got to Vermont a very bright, intelligent class of about fifty, and over one-half of the class were creamery men, employes working right in creameries. They were there for the purpose of learning and we got along very nicely together. I enjoyed it immensely whether they did or not. Now, in Vermont they are not sold in creamery work as we are in the west, but they are working hard to get to the front. They admit that Wisconsin is in the front, but, mind you, they are striving hard to get up to second place, and I think friend Gilbert's state will have to keep scratching to keep ahead of Vermont. The work that is being done by the dairy school, and at the creamery stations, is a grand thing.

We can hardly estimate the good that is coming from the invention of the Babcock test that we now have. I do not believe any man can overestimate the great good that is coming to the dairy itself. The benefit to creamery men is only a drop in the bucket, to what it is to the dairy. The creamery man is going to apply it to the different dairies, and the dairyman is going to apply it to his different cows, and he is going to weed out, and there isn't one dairyman in ten but will find out that he has cows through which he is working at a loss, and he don't know it.

When he applies the test he will find it out and then he will know what to do. I am perfectly satisfied that five years' intelligent work in testing in a dairy will double the profits to

nine-tenths of our dairymen, and what line of work is there on the farm in which we have so much room to improve as in the dairy.

I plead guilty to being a dairy crank. My life and thoughts have run to that a great deal more than anything else for twenty-five years. I know there is nothing on my farm that I take the satisfaction out of that I do out of my dairy.

I am milking sixty-five cows to-day, and every cow is standing on her own bottom; we are weighing up the milk twice a month and testing right along. I cannot do it as carefully as I would like to, because I don't want to trust any hired man to do the testing of individual cows. Once a month we test, and we are keeping the full record of each cow right through, and I am getting some surprises, I tell you. In working out the last test, the percentage of fat ranged from 3.1 to 6.4, but the cow that tested 6.4 had been milked longer than the other one, which, of course, we all understand will make the milk richer. It makes a man feel ashamed of himself to think he has been blundering along through life and these things in the condition they have been.

The Chairman — One of the founders of this association is Stephen Favill, one of the early pioneers in the dairy, and dairy practice in this state, according to the gospel, according to the cow, and I would like to hear from Mr. Favill.

Mr. Favill—Gentlemen, I have no set speech this morning, but I do know something of these dairy matters because I have witnessed the growth of the dairy enterprise in Wisconsin from a very small beginning up to the present. I attribute as one very important factor in the growth of the dairy enterprise in this state, the unselfishness of the founders of the original dairy association. In all my association with the earlier members and with the officers, there has never been the first bit of jealousy or jarring or discord, but every man has worked towards the one object of building up the dairy interests of this state. In the earlier days of this association it was pretty uphill work and we had some hard pulls; we had to pay our own bills and print our own reports, but we talked on, and I feel rejoiced today that we did. Within the last few years it has been a good

deal easier sailing, the state came to appreciate the efforts of this association and has helped us out on printing the reports. I was glad that the legislature last winter did not take any backward steps in this matter.

I have watched the growth of this dairy industry ever since I first made cheese sixty years ago on a farm.

I am here to-day to hear what these young fellows have to say about the dairy and if they have gotten hold of any heresy, I will be after them. Very soon, perhaps, I shall be through, but I am glad that I had a little to do in starting these improvements that are going to be such a very material benefit to this state.

The Chairman — You may think that it is a little queer tha out of that great seething, boiling caldron of Chicago any good could come to the dairy interest, but nevertheless Chicago is to us to-day the great representative of our interests. One of the men who has done splendid work along the lines in which we take such great interest lives in Chicago, and has been of the greatest possible service to us in forwarding the dairy exhibition at the Columbian exposition. I refer to John Boyd, and I know John is chuck full and wants to say something, and we would like to hear from him how things are looking.

Mr. Boyd — I haven't got the hang of the barn yet and I don't want to be held responsible for all the wickedness of Chicago, and when you gentlemen come down to the exposition, you will find Chicago is not such a bad place after all. You will find it is a pretty good sort of a place, and we will treat you well. We expect to see you down there with your butter and cheese to show the world how well Wisconsin has done.

Illinois, it is true, was the first state to take the initiative step in having a dairy display at the world's fair, through our state dairy association. I presume all these gentlemen are familiar with the transactions that have transpired. We called a meeting from the different states; they were well represented. Gov. Hoard, then governor of this state, was elected president of the association, and the officers and members have worked early and late in order to have a proper representation made at the world's fair, and I am glad to say that the whole matter

appears now in a very favorable light. Expensive buildings have been erected and are almost finished at this time. One building for the working dairy will cost in the neighborhood of $40,000. We expect to have there cows from Wisconsin, from New York, from Vermont, and every other state in the union, and all the different breeds of dairy cattle. We expect to milk them on the ground, manufacture the milk into butter and cheese and show what recent improvements have done in our line of business in manufacturing dairy products. We expect that you will send your butter and cheese there and make a creditable showing, and Illinois will send some in competition with you, and we will try to beat you if we can, although we don't expect to do it.

The Chairman — Mr. Boyd has given you something of an idea of the situation. Let me say that I think the dairymen of this United States, who will be greatly benefited by this exposition, can hardly conceive of the difficulty which confronted the Columbian dairy association when it first met and undertook to evolve out of all this vagueness some practical, well-digested system. The board of commissioners, the men who had control of things, had no definite ideas as to what was to be done, so we had to meet in Chicago time after time and evolved something clear and systematic that could be worked out upon this great question.

In my travels east this present winter for two months, I found a constant and strong interest manifested everywhere about this forthcoming exhibition, and we hope during this convention to evolve something practical out of all the thought and all the wisdom which will come together here.

I am hardly able now to say what topics will be presented this afternoon. Mr. Beach, one of our ablest dairy farmers, is ill. Mr. F. C. Curtis is also unable to be present. It makes us feel sad to think so many who are accustomed to meet with us, are lying upon beds of illness. Mr. D. W. Curtis, who has been our secretary since 1874, the man who always seems to know just what to do in bringing order out of chaos, is very ill. I can convey to you gentlemen no idea of the sorrow it is to his staunch heart that in this one annual convention of the year he is denied the pleasure of meeting with you here, but we will

all take hold and do the best we can to make this meeting one of the best of our association.

Before we close this morning session, I know the convention will be pleased to hear a few words of cheer and encouragement from Mr. Adams, who is not only a practical dairyman, but a most eloquent expounder of the cow.

Mr. Adams — If there is anything in the world that will rattle a man, it is to be introduced in that way. The president said he was going to call up the old war horses. Now, I thought I was one of the young colts. At the same time I do not agree with Mr. Favill that an old war horse is of no particular account. I think they are pretty good things to stand by.

I come from a county which is one of the richest in some respects in the state, as well as one of the most populous, but I am ashamed to say that although we have 33,000 cows in Dane county, the average butter production is about 100 pounds per cow. Now, there is no sense in these days in a farmer holding on to a 100-pound cow, when he can see right in the next county a man who with his same labor is producing 150 or 250 pounds per cow. The work of this association is to make him see that and the foolishness of it. We have had a reasonable degree of success. We have been working for twenty years and this association has become a power in this state. I do not want to refer to its work at length, but I do want to refer to just one feature to which Mr. Favill referred, and that is the good fellowship that has bound together by the ties of friendship every man in this association. We stand together like brothers and we have seen the results of it in the growing strength of the association. We have found that we can not only make money out of this association, but we can make friends and so we may be stimulated in our business and be happier and more useful citizens of the state.

The convention adjourned to meet at 2 o'clock p. m.

The convention met pursuant to adjournment.

ADDRESS OF WELCOME.

Mayor Dichman, Oshkosh — Mr. President and Ladies and Gentlemen of the Wisconsin State Dairymen's Association: Official life has a great many pleasant features and I regard this occasion, which gives me the opportunity to welcome you all to our city as one of the bright spots to look back to in years to come. Good farming now is a trade and the farmer who will not use his brain, but will work as his father and grandfather have worked before him does not succeed and especially is this true in the dairy farm. Whoever has watched the dairy interest in our state and has seen it grow from year to year, and has seen the marked improvement that has taken place in the manufacture of butter and cheese in the last few years, will say with me, gentlemen, we are with you. You have done a noble work through this association. You have from a small beginning built up an industry that in importance is second to none. Not only have you shown how farming can be made profitable, but you have taken a load from the shoulders of the farmer's wife, and for this you should receive thanks from all. Since the establishment of creameries in this county, we can notice the change for the better in the quality of butter marketed here in our city. The farmer sees that it is to his interest to put up butter in such shape as will command the highest price. He does not keep it for a month and bring it to market in one large lump as he used to, and he no longer takes offense if the merchant who buys his product tells him it would find better sale if put up in one-half or one-gallon jars or small prints. He now regards butter as a product, just as wheat; no longer an article to take to the grocery and trade off for what he can get, but as a product that will bring him price according to quality, and, gentlemen, for this change we must thank you to a great extent. You have demonstrated to them that they can get a No. 1 price for a No. 1 article and they know that No. 2 butter goes begging.

Now, gentlemen, I will not delay you any longer, and in

conclusion let me assure you all that our city appreciates the honor of your presence. I hope that your deliberations will be crowned with success, and in the name of the city of Oshkosh I extend to you all a hearty welcome.

RESPONSE TO ADDRESS OF WELCOME.

HON. H. C. ADAMS, MADISON, WIS.

Mr. President, Mr. Mayor and Gentlemen — The Wisconsin State Dairymen's association is not only in Oshkosh, but it is part of it. We are glad to be here.

We are twenty years old as an association; we have not completed our growth; we have some of our wisdom teeth but we have not all of them yet. We are old enough and young enough to want to learn some new things. We are old enough to know a good welcome when we hear it and we know enough to appreciate the graceful and genuine greeting which has been given us by the mayor of your city.

We have heard about Oshkosh before; some of us have wandered forty years in the wilderness without getting here, and now that we are here we feel first rate over it. So far we have not been disappointed, we are charmed with this city, we are charmed with the hospitality of your people, we like the looks of the boys and we like the looks of the girls and the looks of your streets, and like the hotels particularly well, and I want to say that I believe if I could stay here six months, I would be as fat and as handsome as brother Thom here. We like the kind of a crowd that you raise up here in Oshkosh. The name of the Oshkosh boy has not only gone outside of Winnebago county into this state, but all over the nation, and we understand that this is a city where the boys never get old, where they are always boys and have those characteristics that we delight to honor in the dairymen's association. We have brought some boys up here to have a good time with your boys, and chief

among them is the distinguished gentleman who presides over this convention.

We consider it a privilege to honor him, we do honor him everywhere and if we were not in his presence, I would like to say some flattering things about him. I would like to say to you that he is a gentleman who for twenty years has been fighting the battles of the Wisconsin farmer with constant intelligence, with constant ambition, with constant definiteness, of purpose and with a constant faithfulness which has borne fruit here in Wisconsin in richer farms and richer farmers and has redounded to the honor and glory of this state all over the United States.

This dairymen's association has come up here for a practical purpose. It has not only come up here to have a good time, but it has come up here to find out things and to compare notes with the farmers of Winnebago county and have them find out some things as well. We have not come up here simply to flatter you, we have come up here to stir up your thoughts if possible about this great dairy industry, to impress upon your minds the value of that industry, not only to the farmer, but to the county and the community in which he lives. We think we understand that this business of dairying has been a great blessing to the farmers of Wisconsin who have engaged in it. We find in looking over this state that the richest counties are the dairy counties, and we can make some comparisons, for instance, between this county of Winnebago and some of the dairy counties which may set some of you farmers to thinking.

I do not come up here from a county which is beyond criticism, but I do come here to say to you farmers of Winnebago county that you are raising cows that perhaps average one hundred and twenty-five pounds of butter to the cow, while over in the county of Sheboygan they have a lot of cows that average one-hundred and sixty-five pounds of butter per cow.

You have about the same area of land here that they have in Sheboygan. They produce annually of small grain two million three hundred thousand bushels in round numbers, you produce in this county two million four hundred thousand bushels, the product, you see, is nearly the same. In this

county last year you made one million five hundred pounds of butter and over, in Sheboygan they made four million five hundred pounds, three million pounds more than you did, on practically the same amount of grain raised, and with all due respect to the prosperity which you have here, I want to say that over here the farmers have more money in the bank, and not only that, farm lands in that county bring all the way from twenty to forty per cent. more than they do in this county, and all the way from forty to fifty per cent. more than in this county, from which I come.

Now, there is some reason for these enormous differences, and the reason lies in this; that in the first place, when a man goes into the dairy business, he is going to get a return from his investment before twenty-four hours are over, the cow declares a dividend before night. You don't have to wait twelve months; a farmer in the dairy business running it in an intelligent way is in a business which brings him in money ever yday in the year; that is above the ordinary contingencies of the weather, which may affect your grain crops.

The farmer who is a dairyman is stimulated by this quick return which comes into his pocket each day of the year; he becomes more of a business man than other farmers, he is a manufacturer and he requires business sense and that study of the market which all manufacturers must have to make them successful. He becomes sharpened and brightened by contact with men in other lines of business, he becomes in short more of a business man.

Another important thing is here, when the dairyman sells one hundred dollars worth of products from his farm, he is not robbing that farm of its fertility. When the farmer sells one hundred dollars worth of wheat, he takes twenty-five dollars of fertility worth out of the soil and the consequence is, that all over these western states you find in the wheat growing counties the farmers are poor, mortgages upon their farms, small buildings and few of them, while if you go into the dairy counties the reverse is true.

This dairy association has worked twenty years upon this industry, it has endeavored to impress upon farmers its value,

it has endeavored to impress upon themselves the new principles which are coming into the field of dairy thoughts all over this nation and the civilized world.

That has been its work and it has built up a business here in the state of Wisconsin which employs one hundred and twenty-five millions of dollars and brings an annual revenue of at least twenty-five million dollars.

Surely these things are worthy of your careful consideration, and we have met here to exchange ideas, to talk freely together, to pool our issues, to put our knowledge all in together, and then each of us carry the whole of it home with us. I have been recently in some other states and I have been proud of Wisconsin. I have found that in Illinois and in Iowa and in Michigan and over in Canada, they are looking to Wisconsin for dairy knowledge and it has been a matter of pride to me as a member of this association that Wisconsin occupies that position as a teacher. I am proud of this state.

I met a man a short time ago, he was a traveling man who sells groceries, and he said, "Where are you from?" — "I am from Wisconsin" — He says, "Shake hands again, I am for Wisconsin every time." He says, "The men in our business can sell more of their goods in Wisconsin than in any other western state, and they can get their pay quicker and they have more fun."

Now, then, we want to thank the people of Oshkosh again for the welcome which you have given us. We shall appreciate it and, as the mayor said he wished, I am sure his wish will be fulfilled, and we shall remember our meeting in this place as one of the bright spots in the history of this association.

ANNUAL ADDRESS OF THE PRESIDENT.

EX-GOV. W. D. HOARD, FT. ATKINSON.

Gentlemen of the Convention—Custom has made it obligatory on the president of this association to deliver an official address at the annual convention.

It is a question whether this is a wise expenditure of your time or not. In the line of this duty I desire to respectfully call your attention to a few suggestions. This association was organized just twenty years ago this month. Its purpose has ever been to foster, promote and defend the development of the dairy interests of Wisconsin. That is its field. Its mission is two-fold. First, to study out what are dairy truths on the farm, in the factory, and in the market. Second, to diffuse these truths as widely and thoroughly as possible among the farmers, manufacturers and consumers of the state.

This association recognizes to the fullest extent the value of right ideas, and its principal work is in educating the farmers of Wisconsin to the understanding and practice of right ideas.

Wrong ideas prevail everywhere. They are the source of all the failure that exists in dairying. It is a noble mission, then to correct them. The splendid preparations which the citizens of Oshkosh have made for your deliberation should prove to you their high regard for the character of the work you are doing. Good men affiliate with good purposes everywhere. Let us take heart of courage then and waver not in our crusade against error and ignorance. The great pressing need of the hour is a wider diffusion of dairy knowledge among the farmers of the state. Dairy enterprises are being established faster than dairy knowledge is gained for their safe conduct.

Lack of knowledge is sure to bring losses and discouragement. The great educational agency of the state in these matters is this association. Can we do anything more practical than we have been doing to spread right ideas among the people? Practically all of our cheese and a very important portion of our butter is made in the factory. The quality of these goods deter-

mines the price. The price determines the revenue to the state and the individual prosperity of the dairy farmer.

It is the man who produces the milk who in reality produces the butter and cheese. The factory men only separate it after it is produced. It is the milk producer's care, cleanliness and intelligent management of his cows that controls in a marked degree the quality of the goods and the price obtained. Hence the necessity of making him "Wise unto his own salvation," as well as the salvation of those connected with him. Take one point for illustration: We are rapidly changing our cows over to the winter production of milk. It requires extra pains, energy and intelligence, to prevent winter milk from becoming affected with the taints and odors of the stable. A majority, I may say, of the farmers are stabling their cows in the same old, unhealthy and filthy way that has been the rule for fifty years. There must come a reform in the construction of stables and winter management of cows, if we are going to make the finest of winter butter. This association must be depended on in the future as in the past to pioneer the truth among the people. New factories are springing up among farmers who have given the subject of their duty in the premises but little thought. They are hungry for better knowledge. They have been grain farmers. Now they must become commercial butter and cheese farmers, each one affecting the good or ill of the factory just in proportion as he is intelligent in the management of his cows.

We have well organized creameries and cheese factories. We greatly need a better organization of dairy knowledge. To this end I would recommend that this association elect a committee from among its members, whose duty it shall be to prepare a set of practical suggestions relating to the care of cows and milk for co-operative dairying, the same to be printed in English and German and distributed to the patrons of all creameries and factories that may apply for them, on the payment of the actual cost and postage.

During the past four years this association has kept skilled cheese instructors in the field visiting factories that desired their presence. Several sections of the state have taken large advantage of this provision, greatly to the advancement of the

quality and price received for their cheese. It has been difficult to secure instructors well equipped in skill and the ability to impart instruction to others. Such men are apt to have factories of their own. Yet only such men should be sent out. This system of cheese instruction is working wonders in Canada, from my own personal knowledge. It is also doing a good work in New York.

The object of it is to enhance the profit of the patron. Any improvement in quality means a better price if the salesman has any selling judgment. It does not directly increase the revenue of the cheese maker, for, unfortunately, he often gets just as much for making poor cheese as if it were good. He works by the pound. The patron above all men should be earnest in his demand for this system of cheese instruction for any improvement means more money for him.

It is a slow and difficult task to convince the average farmer that the dairy business on his part calls for the exercise of the best knowledge he can get.

A tipsy man fell into a ditch. The more he struggled blindly in the mud, the more helpless he became. Finally he concluded to pray, and I commend the character of his prayer to every cow farmer in Wisconsin. "Help, O Lord, and lots of it." It takes good sound dairy knowledge and "lots of it," to make a profitable success of milk production. The questions of breeding, stabling, feeding, and handling are all live questions to every man. Just as he solves them will his success be. Among the patrons of every cheese factory and creamery in the land, you will find a few who are making double the profit on their cows that others are. What causes the difference? Simply the exercise of better thought, better knowledge and more energy. Too many refuse to believe that this business requires intelligence. They are being severely punished year after year for their skepticism. Every factory is a dairy center. We must do what we can as an association to make it a dairy school. This is the only way we can reach the vast numbers of farmers who never attend these conventions. Every factoryman can help mightily in this work, if he will. No chain is stronger than its weakest link. The man who makes the milk is the

principal link, and at the same time the weakest one. Everything waits upon him. The success of the factory, the creamery, the private dairy, the laws that are enacted for the protection of the producer and consumer against the swindle of adulteration, the profitableness of the "cattle on a thousand hills" everything depends on his intelligence and energy.

If the cow could talk I doubt not she would be heard all over the land calling for an improved breed of dairymen. Her small yield of milk and smaller still the profit of it, does talk, has been talking for years, and still there are thousands of so-called dairymen in our state who are as deaf as ever.

Noother branch of agriculture is bringing the annual revenue to the state that dairying is. The following computation will help to illustrate it. I have been unable to obtain from the census office at Washington the number of cows in the state by the last enumeration and so estimate as follows. The increase of cows in Wisconsin from 1870 to 1880 was at the rate of 5½ per cent. annually. Applying the same ratio would give as the number of cows on farms, 876,264. Estimating the gross value of the product per cow at $30, we have the enormous sum of $26,287,920 as the earnings of our cows in 1891. Divide this estimated number of cows by 134,522 the number of farms as reported by the census of 1880 and we have less than six and a half cows to the farm.

This does not look as though the state was becoming seriously overstocked except with poor cows. No state in the union is better adapted to dairy farming so far as fertility, abundant grasses, pure water and climate are concerned than Wisconsin. The northern or great timber portion of the state will yet prove a revelation in this respect. In no section that I ever visited does timothy, clover and blue grass flourish more naturally than in northern Wisconsin. The salubrity of the climate and steady summer temperature are especially conducive to the production of the finest grades of cheese. All that is needed to make of this region the finest dairy region of the world is the diffusion of dairy knowledge.

As near as can be estimated there are about 100,000 farmers in Wisconsin who are more or less vitally interested in dairy

farming. Their power and influence was impressively shown in the last state legislature, when under the lead of certain politicians committed to the oleomargarine interest an attempt was made to overthrow the dairy and food commission and the farm institutes. This association then appealed to the dairy farmers of the state to make their voice heard. They did so in a manner that the upholders of fraud and adulteration will long remember. In your name I wish here to publically thank those legislators who stood by the true interests of the state. This oleomargarine business finds ready and willing tools among leading politicians of both the great parties. Forty millions of dollars is behind this most gigantic swindle of the age. It can subsidize newspapers, silence the voices of senators, and its members of congress, and influence state legislators. All this it has done and will do. The farmer is the legitimate producer of food. Any attempt to supplant him in this work with fraud and deceit is a crime against the nation at large. On this question we should not allow politicians to divide our ranks. Every farmer and every consumer should unite in open and lasting hospitality to any party or politician who will not come out openly in defense of honest food products. Watch these men well and closely. When they ask your support, note if they have stood up in defense of your interests when attacked by a swindle. I am not talking politics, but business. This question of the adulteration of food is the burning one of the hour, and the farmer who will not defend his home and farm against fraud is not worthy of the name of an American citizen.

Certain laws relative to the branding of cheese were enacted by the last legislature.

The most sagacious of our cheese manufacturers saw clearly that something must be done to put the business upon an honest commercial basis, if we saved the name of Wisconsin cheese from becoming a synonym of contempt in the markets of the world.

The Liverpool produce exchange, where once our cheese had ruled among the highest in quality, had addressed a communication to the American secretary of agriculture, charging that cheats and swindlers were destroying our reputation. This

meant serious loss to the state and future destruction of our business. These laws have been in operation one year. They are not as accurate and comprehensive as one could wish, but they have done a splendid work. Dishonest commission merchants and certain over greedy manufacturers are striving to create a sentiment against the law because it compels them to brand their cheese according to its true character. For proof of the good effects of the law, I will cite the fact that for the past year Wisconsin cheese has led in price even New York. The reason is evident. No man need be deceived concerning our cheese. As a consequence, a strong demand has come to our state from that portion of the trade that wants honest goods. We are doing well enough under the influence of an honset policy; let us continue it.

In my travels through the eastern states the present winter, I have been exceedingly gratified by the splendid reputation Wisconsin bears for the grand work she is doing in the advancement of dairy knowledge. Our grand dairy school at Madison under the efficient leadership of Prof. Henry and Dr. Babcock, as well as the work which is being done by this association and the farmers' institutes, is attracting marked attention from the whole continent, as well as in Europe. This should nerve us to still greater efforts in this line. Wisconsin must stand well to the front in the exhibition of her dairy cattle and products at the coming Columbian exposition in 1893. She won splendid laurels at the Centennial exhibition in 1876. The reputation thus gained brought thousands of dollars to the state. There are other worlds to conquer and I trust that we shall be able at this meeting to evolve some practical plan for a "consummation so devoutly to be wished for." Finally, friends and brethren, I bid you be of good cheer, for the future is full of hope and encouragement.

On motion of Mr. W. H. Morrison, Mr. H. H. Curtis was elected secretary pro tem. to act in the place of secretary D. W. Curtis, who was at home sick.

HOW TO CHEAPEN THE COST OF FOOD FOR COWS.

H. S. WEEKS, OCONOMOWOC.

I wish to say in advance, my friends, that I am not responsible for the title to this paper, which appears on the program. It was proposed by our worthy secretary and in a rash moment I assented, but as I face this audience and reflect what may be expected of me, I begin to realize the gravity of the situation, "How to cheapen the cost of feed for cows." There is a suggestion in this that I am prepared to disclose to you some entirely new method, or combinaton of feeds that will bring the cost down to a fraction and cause your cows to double their production like the very seducive advertisements of "patent concentrated cattle, sheep and hog foods," "patent egg-producing food," and the like, which doubtless accomplish all that is claimed for them, at least I have no proofs to offer to the contrary. But, alas, I have no such discovery to disclose to you. The question of cheapening the cost of cow feed is one that I have, doubtless like yourselves, been struggling with for years, and am still struggling with. It is a very broad, many-sided question and a very important one, perhaps the most so of any connected with the business of dairying, because on it hangs the key to success, I mean financial success.

A man may be skillful in breeding and rearing fine cattle and capture the blue ribbon at live stock shows, he may become very expert in manipulating dairy products and take premiums at such meetings as this, yet, if he has paid little attention to the cost of feed for his cows, such successes will savor only of glory and will put no sheckles in his pocket. What we are here for is first and foremost to learn if we can find out how to make dairying pay, and the most feasible plan which I can suggest is to imitate our brethren in commercial pursuits and manufactures, and cheapen the cost of production. We can not, like some of them, resolve ourselves into a great trust and control the prices of our products, and I hope we have no

desire to if it were possible, but we can, by using all of the means at our command, assure success by lessening the cost of maintaining our herds. There are many ways of doing this; the subject might be divided into two distinct parts, first, the direct methods, and secondly those which indirectly have an equally important bearing on the result. Under the former would come the commercial aspect of the case, viz., the cheapening by good business methods and judgment of all feeding stuffs which we purchase, also the crops which we raise for feed. One might suppose that here were two distinct branches of the subject, but they have to be studied in connection. It would not be wisdom to buy such feeds as can be best raised upon our lands, neither should we raise crops to feed which can for various reasons be purchased for less than the cost of production. This is a vast domain and comprises an endless variety of soil and climate, while our means of communication and interchange are so complete that we can readily obtain what we require. But how shall we discover what is the best practice for each of us in this respect. Primarily we must learn by experience what crops our own soils are best adapted to, but seasons vary and conditions change and we must study the markets and keep fully posted on cost and value in different parts of the country. Again, the crops which we can best raise may not be those which will produce best results with our cows and we must know for a certainty what our requirements are. Lack of knowledge on this point causes many of us, I fear, to go on blindly feeding our cows what we happen to have in largest quantity, without thought of the real value and effect.

We are not many of us scientists, and can not analyse our feeding stuffs, and happily we do not need to, for the necessary patient study and experiment by men of profound wisdom and attainments is at our hand for the asking. Tables are prepared and published which give us the relative value of all feeds, and their best combination for given purposes. They deal somewhat in scientific terms, at which some of us are apt to be frightened —but we shall find it a very simple matter to understand them if we will look into it, and though we can not be governed in

feeding wholly by chemical analysis, because actual experience will not always coincide to the letter, yet by the study of these tables we shall learn what the principles of all foods are; whether fat producing, flesh and muscle producing or bone producing. I do not propose to assume a knowledge which I do not possess and discuss these scientific terms or principles here. We all know, however, that corn fattens and keeps animals in good heart and condition in cold weather, and also that clover hay, fed in conjunction, causes our cows to give more milk than corn alone, and we may learn from these tables what other substances approximate in effect, corn and clover, and thus have a guide in selecting what we need. This, certainly, is a plain simple proposition. No science about this to frighten us. We shall find, for instance, that wheat bran belongs substantially to the same class as clover hay, though differing in some essentials, also oil meal and cotton seed meal, while oats, rye and barley are second cousins to corn, etc. I am not going into statistics in this connection, but we should use these tables if we would compete with those who make them a study, and thus we can make up from the crops we raise and the feeds which can be purchased, a well-balanced ration for our cows, viz., one that contains the best proportion for the production of milk, cream or butter; also for beef when we are done with the cows in the dairy. Now, the tenor of my remarks thus far presupposes that we can cheapen the cost of feed for our cows to best advantage by a combination of purchased feeds and the crops which we raise, and in my own case this is a necessity, as I am carrying a large herd on a limited acreage, but I am convinced that on the majority of dairy farms, by proper system and management, all of the feeds which go to make up a well-balanced ration, can be raised to good advantage. The arguments in favor of this plan are, first, that we shall thus be independent of combinations which manipulate prices of what we buy, and what is of even greater moment, we shall avoid the evils of adulteration in feed, which is largely practiced. The question then arises, what crops shall we raise on our farms to best accomplish this; there are doubtless many, but I shall confine myself to a few with which

I have had some experience, and the two which I have mentioned as contianing in a prominent degree the opposite principles necessary in a complete ration for a milch-cow, viz., corn and clover should be the basis, they can be raised at lowest cost on all of our farms, both in my opinion can be most economically handled and preserved, and placed before our cows in most palatable condition in the form of ensilage. This is especially true of the corn crop, and is now so generally admitted on all sides that I need go into no lengthy argument to prove it. Of course, there will be some to whom the old couplet would apply—"A man convinced against his will is of the same opinion still." This man will insist that inasmuch as experiments at the stations have shown that equally good results obtain from perfectly cured and preserved dry corn fodder, as with ensilage, therefore it is a great waste of time and money to build and use a silo. Well, this is a case for common sense to assert itself and decide whether it is possible to cure perfectly, and house, a large corn crop under all conditions of weather and seasons, and if it could be done, whether the cost of housing it would not be greater than that of a silo to hold the same crop. There is some question of the advisability of ensiloing the clover crop, but the same argument partially applies here, the perfect curing of clover hay requires favorable weather and much care and skill and if not well cured there is a great loss of value. The silo, to my mind, offers a much surer method. Next to the corn and clover comes the oat crop, which is a reasonably sure one and furnishes a most valuable feed in conjunction with the other two. Chemical analysis does not show it to belong to the same class as wheat bran, but practical experience seems to prove that it may be substituted for it to almost equal advantage. We will now add field peas as a most valuable addition to the ration, supplying in an eminent degree the principles which obtain in wheat bran, oil meal, etc. Now, these are crops which we all raise, and, as I stated before, I am offering you no new discovery to cheapen the cost of feed for cows, but we do not all feed them in the best proportion, or in the most economical way; when we learn to do this, we shall solve

the problem, and not go off the farm to accomplish it. Unfortunately, clover is not a sure crop in this latitude. We can not always insure a good "catch," and it often winter-kills. In looking about for a substitute, I have found nothing better than millet, which cut when well headed out, but before the seed begins to ripen, makes excellent hay for milch-cows, and aside from the fertilizing effects of clover, roots on the soil. I consider that there is no great loss in the substitution. Most of what I have said refers to winter feed for cows, or for cows kept constantly in the stable, and I am freely of the opinion that it is cheaper to keep them in the year round on such feed, than to pasture them on high-priced land. Especially since the silo offers us a feed so nearly approximating pasture grass, at less than half its cost, because the great crop of corn fodder that can be produced on an acre of land is all of it consumed, while a large part of the grass crop is trodden under foot and destroyed in the pasture. But a man must be governed in this matter by the conditions which surround him. I pursue a partial soiling system, because I have much uneven land unfit for cultivated crops but furnishing good natural pasturage spring and fall, and for that purpose, I sow rye in the fall to turn the cows on early in the spring or cut and feed later in the stables; following this I have a number of sowings of Hungarian or Millet, which furnish a surprising amount of green feed, equaling anything I know of for producing milk and cream. This carries me through July and August until corn is fit to cut, which in turn is fed green, then stacked and fed until the silos are opened.

I have referred to the indirect methods of cheapening cow feed, perhaps quite as important as any I have touched upon, but space forbids me to enlarge upon them. In a general way they comprise the measures taken to secure good crops by fertilization, a perfect seed bed and thorough cultivation, care in securing good seed and the best variety for the purpose intended, these things reduce the cost by insuring large returns for the labor expended. There is a great saving in not overfeeding cows; when this is done, there is a double loss—that of the feed that is so consumed, and the loss of product

which is sure to follow when a cow's appetite becomes cloyed. Warm stables, pure water and plenty of it, salt always acceptable, have an indirect effect in cheapening the feed for cows, because they assist in regulating the functions so that the food accomplishes its purpose.

But, perhaps I am going outside the bounds of my subject and trenching on ground that will be better covered by others, who will address you, and I will conclude what would have been better named in your program —"Some suggestions from an amateur on the feeding of cows."

DISCUSSION.

The Chairman—The jury would like to inquire of the prisoner at the bar what he knows about all this thing he has been talking about. The most important and valuable portion of our published reports of our convention are these discussions and I hope you will fire a lot of questions at Mr. Weeks.

Mr. Adams—If the gentleman would tell us everything he knows about peas, it would gratify some of us.

Mr. Weeks—You had better ask my friend Bender about that, he can tell you better than I can.

Chairman —We will have Mr. Bender on the stand when we get through with Mr. Weeks.

Mr. Morrison—Mr. Weeks, can you increase the butter fat in milk by feed?

Mr. Weeks—That is a disputed question and I am on the affirmative side. I think I can.

The Chairman—In any kind of cow?

Mr. Weeks— I have not had a great deal of experience with all sorts and kinds of cows; have mostly Jersey cows. I think I can do it, because I have found a difference in the amount received when feeding certain feeds.

Mr. Adams—A difference in the cream or the butter fat?

Mr. Weeks—I will say a difference in the cream, because that is my business, and I do not pay much attention to the butter fat if I only get a large amount of cream. Undoubtedly

there are exceptional cases in which certain cream will produce less butter fat than others, but as a rule if you get more cream you get more butter.

Mr. Sawyer — Can you increase your butter fat without increasing your flow of milk on feed?

Mr. Weeks—Yes, I have done it.

Mr. Sawyer—Have you done it as far as you can, or are you continually doing it?

Mr. Weeks—Have fed certain substances, and substituted them for other things and they have given me more cream.

Mr. Sawyer — Then cannot you go a step further and get something else that will do more yet?

Mr. Weeks—I expect I can.

Mr. Sawyer— Did you get more cream without getting more milk?

Mr. Weeks — Yes sir. You understand I sell my cream for table use.

Mr. Gilbert—I can with feed get better milk and get more cream from it and more butter.

The Chairman — Mr. Gilbert, the ex-president of the New York state dairymen's association is the gentleman who just made the statement; make some more.

Mr. Jones—We would like to know how many cows Mr. Weeks keeps on his farm and the size of his farm.

Mr. Weeks—I have fifty cows in my stable at the present time, and I have an average of about twenty head of young stock. I have about fifty acres of plowed land. In my whole inclosure there are one hundred and seventy-five acres, one hundred acres of that is very rough land and Tamarack swamp and bordering on a lake. It furnishes excellent pasture to my cows in the spring and fall generally, but I do not depend very much on this pasture. I depend almost wholly on what I raise on these fifty or less acres. I am buying some clover hay, but I have raised everything except such feeds as wheat, bran and oil meal and that class of feed. I have raised all the roughage that I feed to the whole of my cows.

Mr. Favill—What has been the principal crop you raised to keep this stock on?

Mr. Weeks — Corn.

Mr. Gilbert — How do you plant your corn and at what stage do you cut?

Mr. Weeks—I plant my corn with a one-horse drill in rows, three feet nine inches apart. I plant a twenty-five acre field, one-half of it with large southern corn and one-half to northern Dent. I plant the southern corn as early as I can get my ground in condition and then follow it by the other later. I put the kernels of the large corn about twelve inches apart and the other about nine inches.

Mr. Adams — May we ask what are your gross returns per cow?

Mr. Weeks—My gross returns including a Jersey calf, which we sometimes sell for five dollars and sometimes for fifteen dollars, have averaged one hundred dollars to the cow some seasons, but I cannot say what it is this past season. I have not done that since I had fifty cows.

Mr. Morrison—Where do you sell your cream?

Mr. Weeks—I send it to Milwaukee; the Plankinton House takes ten gallons of me every day the year round, and I have other parties that I send to besides furnishing some cream in my own neighborhood.

Mr. Adams — Do you feed much oil meal, and if you do, do you think it pays in comparison with other feeds as to the cost?

Mr. Weeks—Yes, I think it pays; I did not show good business tact this year and failed to buy early, and so I have to pay twenty-four dollars for oil meal and I paid fourteen dollars for bran, and I consider the oil meal is the cheapest feed. I do not feed in large quantities, only two pounds per day to a cow and I do not pay any attention to how long a cow has been in gestation about that at all. I never had any trouble in that way. I feed a pound night and morning with their feed.

Mr. Thom—Did you ever try to raise millet in a wet season?

Mr. Weeks—No, because I usually need all my land for other purposes. Since I have been a farmer we have had series of droughts and I have been put to my wits end to furnish green feed enough to feed my cows.

Mr. Thom—I do not think that millet can be preserved in a

wet season, that is to preserve your reputation as being a man of temperate language.

Mr. Ingalls—Did you ever raise sweet corn for soiling?

Mr. Weeks — Yes, I have; I usually have several plantings of corn for soiling, beginning with some very early and finishing up on evergreen.

Mr. Gilbert—Can you tell us what your ensilage cost you?

Mr. Weeks —I figure my ensilage costs in an average season not much over a dollar a ton.

Mr. Sawyer — I would like to ask these gentlemen who state they can increase the quantity of cream by feeding, how they do it?

Mr. Gilbert — I have had the best results from cotton seed meal in making rich milk and I can go into my dairy room any day and tell when a change is made from common feed to cotton seed meal within forty-eight hours by the quality of milk which is so thick that I cannot pour it out of the pail without leaving fat on the outside of it.

Mr. Sawyer—But will that change be maintained at the end of thirty days?

Mr. Gilbert — It will. That cow will give richer milk right along. She will not change back again so soon, but nine times out of ten the cow goes back on the poorer food.

Mr. Boyd—I wish Mr. Weeks would tell us just exactly how and what ration he is feeding.

Mr. Weeks—I haven't figured out the cost very closely, but I am feeding about forty to fifty pounds of ensilage with a good deal of corn in it. With that I am feeding about five pounds of clover hay at noon. I am feeding about eight pounds of bran and two pounds of oil meal.

Mr. Boyd— By counting ensilage at a dollar a ton that would be about thirteen cents per day for each cow.

Mr. Sawyer—How much per day does each cow bring in for cream, your general average?

Mr. Weeks — I am milking about thirty-six cows and the amount of cream I get per day is about twelve gallons.

Mr. Sawyer — If it is a fair question, what is your price for cream?

The Chairman — Mr. Weeks need not answer that, if he is going to criminate himself.

Mr. Weeks—I have been in various businesses. I was brought up in the bank of a very strict Scotchman and he was not a man that inculcated the idea that it was best to tell all your business at all times.

Mr. Gilbert — I met a gentleman a short time ago in Ohio who was in the dairy business and he is applying dairy principles to his business. He milks twenty-five cows. His ration is from forty to fifty pounds of corn ensilage per day, five pounds of clover and mixed hay and five pounds of wheat bran and his average product per cow the last week in December was 5.65 pounds of outter per week, making the butter cost about 12½ cents per pound and he got 20 and 30 cents per pound.

Mr. Adams — We are having a controversy in the dairy world everywhere in reference to this matter of feeding butter into milk by changing the rations. There is a division of judgment; the great body agree with Mr. Boyd and Mr. Weeks and think that they can change the ration of a tolerably well-fed cow in such a manner as that.

They can give you milk containing an additional percentage of butter. As I understand it, the work of the experiment stations in the United States and other countries disproves that position. I would like to know what you think about it.

The Chairman — Well, I don't know any more about it than you do, but I will tell you what I think about it. I think in the first place that the world lacks to a large degree the sufficient amount of careful experiment necessary to know anything about it. Then I have a theory which I am confirming every day, and it is this: When a cow is born she is born with an individual limit of proportion in her solids. Now, milk contains say, 84 pounds of water, 200 pounds of milk and 4 pounds of fat, and there is about an equal proportion of caseine and other solids. There is a proportion between the cheese and the water and the sugar and all of them. There is a cow which is born with a limit of four per cent. of butter fat, but she never has been fed up to more than three or three and one-half; some man takes her and commences to feed her, and at once she re-

sponds and he says, "You can feed butter fat into a cow's milk." But has he fed far enough to see whether he can feed it indefinitely into it or not? One thing is sure, you cannot bring out of a cow or a horse what is not in them. You take a cow that has a high limit of butter fat, say eight per cent., and she has never been brought up to four, feed her and she will spring right up to her limit, but when she has struck it, she stops. That is my theory.

Mr. Boyd—I do not suppose that any one thinks that when a cow has reached her limit, that you can exceed that under any circumstances. But we know this, that if you are feeding a poor cow hay, and change her feed to cotton seed meal and bran a balanced ration, that you will produce more butter, and we also know a thing that has been lately confirmed by scientific experiments, that a cow fed an ordinary ration, and reduced to something poorer, the butter fat in her milk is decreased. Dr. Robert Mead Smith, one of the best authorities in the world, says that to increase the ration of corn meal you decrease the quantity of butter fat in the milk, and it is my experience also. From my own experience I know that I cannot produce a large quantity of butter from a cow by feeding a large quantity of carbonaceous food, but by increasing the nitroginous food, I can increase the butter fat every time. I find that the narrower my ration is, the better results I get.

The Chairman —What do you mean by a narrow ration?

Mr. Boyd—One pound of protein to four pounds of carbon.

Mr. Morrison — Let us have the ration you give.

Mr. Boyd — This winter I have been feeding a little short of forty pounds of ensilage, three pounds of mixed cotton seed meal and oil meal, two of the cotton seed and one of the oil meal, seven pounds of bran and five pounds of hay. They are weighed rations, not guessed at or estimated. Those cows that receive that ration are producing on an average of the whole herd of about a pound of butter a day. I estimate that the ration cost me about 12½ cents a day.

The Chairman — Do you feed that indiscriminately to every cow?

Mr. Boyd—No, that is only given to the cows that are in full

flow. I cut my cows short on the oil meal and on the cotton seed meal when they are not giving milk, although the cotton seed and oil meal rations are the cheapest rations I am feeding with the exception of silage. I estimate my silage about as Mr. Weeks does, at a dollar a ton. I am getting as near a I can get to it 35 cents for my ration of 12½ cents.

Gen. Burchard — How would it do to change this question right about, and ask whether you could feed fat out of the milk? It seems to me we are hardly taking enough account of the individual animal. Of course, we don't know where the limit is until we have made some careful experiments, but I am one of those people who incline to the opinion that it is a little bit useless to kick against the stubborn facts such as Mr. Weeks gives us there, confirmed by Mr. Gilbert and Mr. Boyd, that they absolutely have done this thing, that by changing the ration of their cows thay have absolutely increased the per cent. of butter fat in the milk. Now, it does not follow that because they have done it that they could go on, and on and on in this road and it should never turn or come to an end, because they will all undoubtedly say that there is a limit to this business.

Mr. Boyd—You can decrease the amount of butter fat simply by feeding salt to your cows.

Mr. Adams — Does that decrease the total amount of butter fat or the percentage of butter fat?

Mr. Boyd—It decreases the percentage of butter fat, and the quality of the solids. You can do it by feeding brewers' grains and see the effect in twenty-four hours.

Mr. Adams—At one time when I was in the milk business I became anxious to increase the flow of milk, and I began by giving my cows warm water. They would drink all the way from 100 to 140 pounds a day, and they increased their milk flow very nicely. I thought if that was a good thing, that some more was still better, and so I put some salt in the water and gave it to them for a number of days.

And they drank so much water they could hardly stand up and they increased their milk flow about thirty per cent., and the per centage of cream went down from four to three inches, but I got about the same total cream that I did before. It is

one of the singular things in this business that we get so much honest experience that is so different. My experience has been the same that I have obtained the best results when feeding a ration which had a larger proportion of the carbo-hydrates than Mr. Boyd's ration contains and I have no doubt that there are farmers here who have fed corn in the shock where the proportion is about one to eight, and have had a splendid flow of milk.

Mr. Gilbert— I think you can feed a wider ration. Two years ago I was feeding fifty cows, and I had nothing in the barn to feed except what I had bought in and except my corn ensilage. I was feeding those cows about forty pounds of corn ensilage a day, two pounds of cotton seed meal and four pounds of wheat bran. With that amount of feed, costing me in round numbers 11 cents a day, those fifty cows during the two months of December and January, gave me an average of 41 pounds of butter a day. That is in the line of about the ration of Mr. Boyd's feed. Now, I find this, that whenever I widen by adding corn meal to my ensilage, it will do in cold weather, but I did not get any benefit from it. I found that in feeding too much carbonaceous feed, it is apt to pass through the animal undi gested.

The Chairman — Mr. Weeks spoke about the adulteration of these feeds. The other day in New York I ran across a funny experience. I found a man selling machines to millers, a machine for the purpose of grinding corn hulls. They grind it up with common bran, the hulls of the corn give it a whitish appearance, and they sell this compound as middlings. Mr. Weeks also spoke of the difficulty of securing a good catch of clover. While in Waushara county two years ago, in that very dry season, I found an old farmer who had this for securing a good catch of clover. He soaks his clover seed about twenty-four hours; he then takes it on the barn floor, and with a bushel of clover seed, he mixes a bushel of land plaster and shovels it together until each little clover seed is covered with a coating of land plaster, and every one says he never has failed of a catch, even on the hot sands of Waushara. This was sown and brushed in as early as possible in the spring. It would be better if he could sow it on the snow, he thought, but

he could go to work on that land very much eariler than you can on ordinary land. Mr. Weeks spoke about rye also. A number of farmers in the state are falling into the practice of sowing their rye at the last cultivation of the corn, sowing about bushel of rye to the acre. Then at the cutting of the corn you have a nice body of rye which gives you a pasture in the spring about six or eight or ten days before you can get it otherwise.

Mr. Favill — Not when it is as dry as it was last fall.

The Chairman — This last fall I am not talking about. God disposes, but you keep proposing all the while, nevertheless. I want to say that I was visiting at Prof. Robertson's experimetal station in Canada and he told me that by long experience he found such a ration as Mr Boyd and Mr. Gilbert suggest the most practical. He could not secure economical results if he exceeded seven or eight pounds.

Mr. Gilbert—I have found that when I exceed even or eight pounds supplementary feed it is a loss. I forgot to tell you that my butter was produced from less than fourteen pounds of milk in the last two months, and I found that that six pounds I fed that winter was the most economical feeding I ever did.

A Stranger—What is your breed of cows?

Mr. Gilbert—Jerseys and grades.

The Chairman — If every dairyman and farmer would keep a glass and inspect the excrement from his animals, he would have an opportunity to learn a very profitable lesson.

Mr. Gurler—I am feeding this winter not to exceed fifty pound of corn ensilage and it is grown from planting ten quarts of seed to the acre, so that I have considerable corn. I aim to get all the corn feed I wish the cow to have in the ensilage in place of feeding it otherwise. I am feeding four pounds of wheat shorts and four pounds of Shufelt's grano-gluten feed, which costs about $13.00 a ton. The shorts and the grano-gluten cost me six cents a day, eight pounds at an average of $15.00 per ton. Now, put the corn ensilage in at a dollar a ton which was two and a half cents a day. Now, I don't think it is right to figure corn ensilage down that way. We are not giving the farm any credit. Of course it is all right if we understand the basis on which we are talking. We might have

grown some other crop on that ground that there was a big profit in. I figure my ration is costing me eight and one-half cents a day per cow. I am milking sixty-five cows. We are taking on an average fifteen hundred pounds of milk into the factory, and figuring that out, my cows are making a trifle over a pound of butter per day, at a cost of eight cents and a half.

Mr. Gilbert—At what stage do you cut your corn for the silo?

Mr. Gurler — I cut it when it is just beginning to dent. I plant some of the large Southern ensilage corn first, as early as I can, then I plant later two varieties, our yellow dent corn, and the early variety of our dent corn, and wind up with the evergreen corn, and I suceeded pretty well in getting the corn, all of it, just at the right stage, by the time I was ready to put it in.

The Chairman—You are about 175 or 200 miles south of here?

Mr. Gurler — Yes. For the people who live here, I would grow the corn that I could mature to the point it would dent.

Mr. Davis—How do you feed your bran, mix it with the silage or dry?

Mr. Gurler — I put mine right on top of the silage.

Mr. Weeks—That is the way I do.

Mr. Gilbert—I feed the silage first, and then my feed dry.

Mr. Boyd — I mix mine so that it sticks to the ensilage. I want to say I met a gentleman south who has produced the best results I ever saw in feeding 125 Jersey cows. He was feeding cut hay with oat siftings and corn meal. He cut the hay on the floor above, it came down to the lower floor and there it was wetted over and turned over with a large fork. They then threw on some of this oat meal it was really the residuum from an oat meal factory with a certain quantity of corn meal. I looked at his records, figured them up and I found that he was producing from his herd of Jersey cows, all registered cattle, from six to twelve thousand pounds of milk a year.

Mr. Adams—Feeding corn meal, too?

Mr. Boyd — That is true, he was feeding corn meal, but I think the secret of his success was in the thorough mixing of his grain ration with his cut hay. The hay was what I call very inferior hay.

The Chairman—I want to make one suggestion to some of our people who may be somewhat puzzled by some of the terms used here. I wish that every farmer in Wisconsin would send to-morrow and buy "Stuart's Feeding Animals." My friends, it would be worth in every farm home in this state $100 the next year. It gives you the definition of feeding terms, and also feeding tables, and the analysis of feed. I have had lots of men write to me and say, "What do you mean by the use of the words, "protein," "albumnoids," "carb-hydrates," etc. I see them in your paper so much." That touched me right to the centre. We have all learned to use and understand the words "telegraph" and "telephone," and we can learn these words. All feed is divided into two principal elements; one is called the carb-hydrates, that is the heat-producing, the starchy matter; corn meal, for instance, is a carbonaceous food, with a large amount of heat producing elements in it. Then there are other feeds which are high in protein, that is, the element that makes muscle, and supports the nervous and muscular system. Cotton seed meal is very high, oil meal is high, pea meal is high, oat meal not so high, but contains another element called "arvine," a stimulant to the nerves. You feed a horse on corn and he goes poking along, you feed him on oats and he goes as if he was going to a dance. It will be worth the while of every one of you to buy that book, and make yourself familiar with these matters.

APPOINTMENT OF COMMITTEES.

The chair appointed the following committees:

Committee on nominations—W. H. Morrison, B. E. Sampson, J. W. Washburne, Charles Thorpe, and Chester Hazen.

Committee on resolutions:—Geo. W. Burchard, H. C. Adams, and H. C. Thom.

DISCUSSION (Continued).

Mr. Morrison — I would like to know if Mr. Weeks raises his own dairy cows to take the place of those that drop out, or does he go around and pick them up?

Mr. Weeks — Well, sir, I raise my heifers. That has been the way that my herd has been built up. It was commenced by my father with a few Jersey heifers that came from Lake Mills full blood, but not registered, and he raised all his heifers for the years that he lived, and for the last seven years that I have been running a farm, I have filled up the herd from about twenty-five to fifty head in that way.

Mr. Morrison— I want to add my earnest protest against the idea of killing the best heifer calves from our best cows. I notice that the best dairymen in our state are keeping up their herds by saving their calves, as Mr. C. P. Goodrich does, and the late Hiram Smith did, and others who are equally successful.

Mr. Gurler — I want to add my testimony to that. We can't go around the country and buy the right kind of cows to replace those that we have to get rid of, and keep on the upgrade. I have tried it and never could do it. I had to go to work to raising my own cows.

Mr. Hubbard — I want to inquire what age these gentlemen would have their cows come in?

Mr. Gurler — I think we will get a better cow and a more profitable one if we have her come in at two years, and if the calf is kept growing properly, there is sufficient size at that age.

Mr. Hubbard — Would you get as large a cow at that age?

The Chairman — Why do you want a large cow?

Mr. Hubbard—To look at.

Mr. Randall—I want to ask Mr. Weeks if he thinks peas are so good, why he didn't raise them and feed them?

Mr. Weeks—Simply because I have but a small acreage as I told you before, and I haven't reached it yet, but I do intend to raise them next year.

Mr. Hazen—Mr. Weeks, you say you sold cream to amount to $100 a cow during the season? Now, about how much butter would that cream make per cow?

Mr. Weeks — There is another point in regard to the use I make of my cows, which I did not state, and it should be stated to make it fair. I sell a considerable portion of my skim milk at home, at two cents a quart, and the $100 includes that. I should figure that if I got thirty cents a pound for my butter the year around, I should be doing about the same as I am doing now.

Mr. Thorpe—Do you think your cows would make 250 pounds of butter during the year?

Mr. Weeks—Yes, I do.

Mr. Gilbert — I have had considerable experience in raising peas, what I call my succotash feed, pease, oats, barley, and mixed, and it is the most profitable feed a dairyman can raise. I use it first for soiling when my pastures are short. It is the most profitable feed I have been able to raise. I harvested with the harvester. The peas will cling to the oats and stand up.

Mr. Bender — I put my peas in with Will's drill. I drilled them in four inches deep, then I sowed oats on top of the ground about a bushel to the acre. Two and a half bushels of peas to the acre, small, Canada peas. I cut them with a mower, oats and peas togther. In places the oats did not hold up but I made up my mind I could get the whole crop better with the mower than I could with the harvester. I put them up in bunches and dried them. I put them in a stack and covered them and threshed them with a machine.

Mr. Dillingham — How much did they yield?

Mr. Bender—I raised a little over one hundred bushels on three acres, and it was a very dry season. I get them ground and put them with the bran and feed in that way.

The Chairman—Pea meal, gentlemen, is almost as good as linseed meal.

Mr. Bender — I will say heretofore I fed my cows corn ensilage, about forty pounds, with a mixture of bran, but I never have had my cows do as well, as they have this year with the peas. I believe I formerly fed too much corn to the cows in the ensilage. We never heve had as much butter from the cows as we have this winter.

Mr. Favill —You didn't try feeding the peas without threshing, feeding it as hay?

Mr. Bender — No, I didn't.

Mr. Favill—I have met some gentlemen who have done that. They would cut the oats as soon as they were in the dough, before they got very ripe, they put them up the same as hay and feed it as hay and saved the threshing and grinding, and they have got most excellent results.

Mr. Dillingham —Wouldn't it be better to run it through a feed cutter?

Mr. Favill—Yes, if you have a feed cutter. But these gentlemen are feeding it whole, as you would hay, and it was all eaten up with a relish, straw and all.

Mr. Bender — Do you think the cows like to eat the peas whole?

Mr. Favill — Yes, they have good teeth.

Mr. Sawyer — Mr. Bender, did you have an increase in the milk, as well as the butter?

Mr. Bender — It would be hardly fair to compare it that way with the year before, but I will say the flow of milk has kept up better. The cows have been in better working condition, and the amount of butter has held up better on this feed than ever before.

The Chairman—We must all consider what we are going to do with what we have in the economy of our dairy farming. Now, we are paying out hundreds of thousands of dollars, to Minneapolis for bran, when we ought to keep that money in our pockets, at least we ought to keep two-thirds of it, and we can do it if we have sense and wit enough to grow peas. I commenced this crusade about peas about two years ago, drawn from my study in Canada, and I saw that we were not doing wisely nor the right thing in order to keep the money in our pockets. I found men in Canada and elsewhere growing peas and making a very profitable use of them, and I found that when I came to talk with my neighbors down here in Jefferson county, every farmer said, "You can't grow peas in Wisconsin." And then I found that the reason why was because nobody knew how. The pea is a deep rooting plant, and it needs to be planted and covered deeply. Everybody has been planting them on the surface of the ground,

then when there comes a rain storm their bones whiten the field. Peas should be planted not less than four inches deep. I remember when I first planted my garden peas four inches deep, an old English neighbor said, "You will never see them peas again," and I didn't know but he was right. But they came to light, and I had pease in three months and I counted one of the triumphs of my going to Madison that I put peas down into that executive garden four inches deep, and it demonstrated to the state gardener that peas would grow two or three months even in an executive garden.

Now, I want to show you a little calculation. You take ordinary bran to-day at $15 a ton. You take pea meal. Now, two pounds of pea meal, as near as I can find out, from men who have tried it, and from a little experience of my own some years ago, two pounds of pea meal is equal to six pounds of ordinary bran, as a butter food for the cow. Now, if that be true, you can produce on ordinary land easily 25 bushels to the acre. Mr. Bender produced 33. Twenty-five bushels will give you 1,500 pounds of pea meal. At the rate of 2 to 6 the value would be equal to 4,500 pounds of bran. Now, that would be $33.75 for your peas per acre, which you have saved at home, which you have put in your own pocket. You have saved paying it out, and I tell you my friends, that when we get at this pea experience we will find it is a great thing for the state of Wisconsin if we only study it a little more. I am delighted to hear of Mr. Bender's experience. Gen. Burchard tried peas last year, and I want him to tell us about it.

Gen. Burchard — It so happened in regard to this pea culture that I had an opportunity to have a little conversation with Mr. Pierce, of Canada, who knows a good deal about it, and I gathered what information I could from him, and thought I would follow as nearly as I could the system that he said obtained in Canada, as far as the sowing of the peas was concerned. My neighbor and friend, Mr. McPherson, clubbed with me, and we sent off and got a few bushels. He sowed his with oats, I sowed mine without. You all know what an unfavorable season it was for everything. The peas were got in pretty good time and shape, but the intense drought came on and

they came up very unevenly, and, as a matter of course, ripened very unevenly, and I had to leave them on the ground in order not to get too much green stuff until they went down very badly. I could not mow them with a mower at all, nor with a scythe. We tugged at them one way and another till we were disgusted, and we let a large amount of them on the ground, and then we bunched them up and pushed them onto a wagon and hauled them up to the stack. There were a great many left in the wagon and they rattled out here, there and everywhere, but we finally stacked quite a little bunch, and when the threshing machine came, we threshed them, and I am persuaded in my own mind that I shall, not on my farm, sow any more peas that way. I shall try the experiment the coming year the other way. Mr. McPherson claims to have succeeded a little better than I did; he cut with a mower, but he broke his mower in the operation. My hogs didn't even like to pick up those peas, they were too hard.

Mr. Bender — Did you put your peas in with a drill or sow them?

Gen. Burchard — I put them in with a drill

Mr. Ingalls — I plowed mine in. I sowed them broadcast and plowed them in, two and a half bushels, plowing them under after they were sowed, I plowed about four or five inches deep.

Question — What kind of peas did you sow?

Mr. Ingalls — I think they are what they call Canadian peas; small peas. My seedsman in Chicago got them for me.

Mr. Howard — I have experimented raising peas thirteen years. I generally sowed two and a half bushels to the acre, and plowed them under about six inches deep and as fast as they come out of the ground, I drag the ground, just as smoothly as it can be dragged; then I take a roller, or a plank and plank it smoothly. Sometimes I take an old Baldwin rake and go over them and drag them as if they were raked up with a garden rake. I can take a spring tooth harrow very early in the morning and rake them off just as nice as hay. I brought that from the state of New York forty-two years ago this spring.

The Chairman — What yield do you get to the acre?

Mr. Howard — From eight bushels to fifty.

Mr. Bender — That is a great point. People should be particular about the preparation of the ground. When you get a uniform depth of peas on thoroughly harrowed and rolled ground, you will get a good uniform crop. Even in very dry seasons I have succeeded in getting a very uniform stand of peas. If you are going to put the harrow on and sow your oats, you will get many of those oats in the drill mark, and they will help to hold up the peas better than if the ground was harrowed first.

A Stranger — Can peas be siloed successfully?

Mr. Gilbert—Senator Palmer, last season, put in the product of ten to fifteen acres' peas, oats and barley into the silo, and it was as profitable feed as I ever saw. It was run through the cutter. It was in the dough, both the peas and the oats. His man, Mr. Van Orman, told me he had never fed more satisfactory feed.

Mr. Bender — There is one point in this pea business. If you raise any amount, I don't know how you can stack them to save them all right.

Mr. Gilbert—I have cut most of my peas with the reaper and binder.

The Chairman—But in that case you do not get a large proportion of peas to the acre.

Mr. Gilbert —I sow one bushel of peas to the acre, and one of barley and oats. In the first place I plow my land. I sow my barley and then I drag it. Then I put my peas and oats in together.

Mr. Fuller—We have made a practice at home for four or five years of sowing a bushel of peas to the acre. We cut them with a binder.

The Chairman —What is your experience as to the quality and value of the feed for butter?

Mr. Fuller — Well, four years ago we sowed quite a large piece of peas. We had fifteen acres which we sowed for the market, but the price was low that fall, down to fifty or sixty cents per bushel, so instead of selling them, we ground them up, mixed them with oats and bran and fed to

our cows. I was at home a short time, and took six two-year-old heifers, with their first calves, grade Short Horns, and we fed them one feed a day of marsh hay, one feed a day of clover hay, and I have forgotten just how much peas and oats, but I know that in two weeks we got just 84 pounds of butter from those six heifers, a pound of butter per day, and we considered that our pea meal that winter was the best feed that we ever fed our cows, and since that we have raised peas with oats to feed as far as they will go.

Gen. Burchard — I would like to ask Mr. Gilbert what is the reason for mixing that barley with the feed, why not put it all oats?

Mr. Gilbert — I think it makes a little heavier feed. I got in the habit of it anyway. I first went into that about eight years ago for soiling purposes, and having some left over I found it very valuable to grind, and for the last five years I have raised it for that purpose, and whenever I have that I don't have to buy any bran or any other feed. I think barley is an excellent feed for milch-cows.

Mr. Bender — What has been your average yield per acre?

Mr. Gilbert — Not very large, about thirty-five to thirty bushels.

Mr. Adams — I will give my experience. I sowed twenty acres a number of years ago, of peas, and the yield was fifty bushels and the cows have been laughing about it ever since.

Mr. Morse — I would like to ask what kind of soil is suitable for raising peas, and also if tiled marsh is suitable, and if so, what fertilizers, if any, are necessary?

The Chairman — One thing you must be careful about and that is, putting peas on too rich ground, or you will have a tremendous growth of vines, and a small growth of fruit. An ordinary soil seems to do well with peas.

Mr. Thom — It was reported at a recent meeting held at Elroy by some men who were present that their annual yield from peas was from fifty-five to sixty-five bushels per acre. And that a yield of 100 bushels per acre was among the easy possibilities. That is quite a sandy locality and some clay.

Mr. Odell — Those are facts that Mr. Thom stated. There

were gentlemen in that meeting who laughed at the men from Iowa county who said they raised as high as forty to fifty bushels of peas and oats to the acre. They said fifty bushels was common, and sixty-five bushels was not uncommon. They didn't fret about putting them on rich land, only they put more seed on.

Mr. Favill — I heard those statements and I did not believe them any more than I do now.

Mr. Morrison — In holding institutes in about sixty-five counties in the state, it is surprising what we run against on this pea question. Down in Grant county, there is a little territory where nearly all the farmers are raising peas, and they give the very best experience, and also in some parts of Iowa county they are raising a large amount. Of course, you know that along the lake shore they go into it extensively, but in Dunn county where much of the soil is light, many of the farmers are having excellent results.

Mr. Favill — Notwithstanding the big stories those fellows tell, I think the universal testimony as to the value of peas is good, but they do tell some all-fired big stories.

Mr. Bender—I can readily see if they sow two and a half bushels of peas and a half bushel of oats, and then give all the credit to the peas, that they can make big stories, but that is not fair to the oats.

Mr. C. R. Smith — I raised peas and oats this year, and it was the most profitable crop I ever raised.

Mr. Buell — I am not much of a farmer, and certainly not much of a public speaker, but I would like to add my testimony on this question. Three years ago I became acquainted with a man by the name of Pinkerton over near Menasha, who raised peas of a kind he called Blue Peter, and he persuaded me to take home a couple of bushels to sow. He says, "Sow about two bushels to the acre of peas to a half bushel of oats." I sowed my peas and then sowed the half bushel of oats, and I believe they yielded fifty bushels of peas alone, and I never raised anything in my life that went as far as those peas and oats. I even saved the pea straw in the barn and cut it up and fed it to the cows, and the good lady, with whom I live, says, "Pa,

what are you feeding the cows now?" I told her, and "I declare," says she, "we are gettinng nice cream." This last year I sowed three bushels of those Blue Peters to the acre. Some of them came up and some of them didn't, but I had a pretty fair field of peas. If I live I shall sow five or six acres of peas and oats this year.

The Chairman — A very simple way of handling peas is as follows. Select a good piece of fall plowing, good average soil, as early in the spring as possible, because they are not affected by the frost, you know. Get onto that land and drag it and if you have a good seed bed, sow on it, about two to three bushels of peas. If they are large, sow three bushels, if the Canadian, two and a half to three. Then turn on with the plow and plow them under four inches deep. After you have plowed them under, sow a bushel to a bushel and a half of oats to the acre, and the oats serve to hold them up. Remember that you get one vine from one pea, and consequently you must seed heavily. That is a fact that I learned from a Canadian pea farmer, that the great difficulty with people was that they refused to plant deep enough and seed heavy.

Question — Where you sow your peas four or five inches deep, wont they be so long coming up that the oats and barley will mature before the peas hardly get out of the blossom?

The Chairman — You may lose some oats, but you make it up in peas. In Canada they have machines for harvesting them. You will see them advertised in the Canadian Agricultural Journal. I cannot describe them, but I think they are not very expensive. If you will address John Pierce, of London, Canada, he will give you information about them. It is now time for us to close this very interesting discussion. We have certainly had a profitable afternoon.

Mr. Thompson — I would like to ask one more question in regard to the soil.

The Chairman — Peas grow on all kinds of soil. They grow at Grand Falls, in North Dakota, with great success, on that rich, black land. They will grow wherever they can get moisture very kindly. As we are situated, that is the reason why we should plant them deeply.

Mr. Chandler — This gentleman has the same kind of soil that we have. We are on black prairie soil, and we have all we can do to keep our oats standing so we can cut them at all.

Mr. Hazen — On the soil where I live we have been dairying there a good many years and only about one year in four we can sow oats so we can harvest them with a harvester. We sow them about two and a half bushels to the acre, sometimes, and sometimes three. It didn't seem to make any difference.

The Chairman — At the Wisconsin experiment station I saw twelve plats of oats two years ago sowed for the purpose of determining the best variety to stand up. Some were perfectly flat. The white Schoenen stood up perfectly straight.

Mr. Hazen — Any oats in the heads?

The Chairman — Oh, yes.

Mr. Sampson — I should think such land as has been spoken of would be more profitable to raise corn on. I never have had any profit in sowing oats on rich land; it would fall down, and when it falls down, it will spoil, and if the oats are sowed to hold up peas, and the oats wont hold up themselves, I shouldn't think the peas would be very profitable.

Mr. Hazen. — Oats with us are the only small grain we can grow that will stand up at all. Sometimes we can harvest them with a good deal of trouble. We get from seventy-five to eighty bushels. We can't plant our ground all up into corn. Some of our neighbors have tried flax, and it stands up pretty well.

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

The convention met at 7:30 P. M. The president in the chair.

SALTING BUTTER.

F. C. CURTIS, ROCKY RUN, WIS.

I assume that it is generally considered that butter absorbs salt, which it does not, in proof whereof I will state that some two months ago I worked up about a pound of butter into a solid ball without salt. This butter has been kept immersed in strong brine until the present time, when I find on cutting it open no trace of salt, except near the outer surface of the ball. Salt properly exists in butter only as brine; if found in the butter in an undissolved state objection is made by any good judge of butter.

My study and observation on this subject is founded upon churning, salting and handling almost daily for a long time about twenty pounds of butter in a rectangular churn; salting while in the granular state and mainly working it by revolving the churn. Some three or four years ago it was persistingly taught that "brine salting" was the proper method to introduce the salt into the butter, but this proved a delusion; for it seldom made the butter sufficiently salt; not only that, but it was more labor, took more time, and was a great waste of salt. The proposition was plausible upon the theory that by giving it time, the granular butter would absorb the salt from the brine. Butter, when churned and drained, and washed in this state, holds an uneven quantity of water — that is, different churnings will hold an unequal amount of water, no matter even how well drained. It will be found that the finer the granules, the more water it will retain and as the granules are coarser the less water the butter will retain. No butter can be drained so dry in the granular form that it will not exude water upon being worked or packed

I believe it is conceded that good butter has about thirteen per cent. of water in its composition and that this water holds the salt needed in the butter, which is about all the salt the water will dissolve. From this reasoning it will be seen that the amount of salt needed in butter depends upon the amount

of water in the butter when the salt is added. Let us suppose we have a quantity of drained granular butter with twenty-six per cent. of water in it — our object is to salt only half of that water, but that is an impossibility; we must salt all the water in butter, hence it will be found we are required to use one ounce to the pound, twice as much salt as is needed to season the butter, for half the salt used will come out in the exuded brine. There is no danger in getting in too much salt, provided no more salt is put in than will dissolve. Sometimes twenty pounds of butter after salting in the granular state will exude three or four quarts on revolving the churn and working it into a mass, and sometimes not more than one pint. The difference is undoubtedly in the firmness or coarseness of the granules when the salt is added.

I should be glad to extend this paper for I consider it very important, but I find myself so ill that I am unable to do so.

DISCUSSION.

The Chairman — This is in simple words a clear statement of some of the principles that apply in our manipulation of butter on the farm. Farm butter, as a rule, is made, we may say, without much study of these principles. Coming down tonight from the hotel and talking with my friend Ingalls, I made this remark, that a principle lies behind everything we do, dairying as well as every thing else. If a man started to drain a piece of land and did not hold himself obedient to the principle that water must run down hill, he would dam his land rather than drain it, and end, may be, in doing the same thing for himself. The object of dairy study, dairy reading, dairy thought and dairy practice is to look into this question of a principle, and when we once get it clearly into our comprehension, the principle then guides us and not blind practice. We must have a larger intellectual realization of our work. That comes through the brain, the study of those things, and we need this onstant thought all the while. Now, we are dealing with butter, for instance, with a peculiar compound. Milk is drawn

from the economy of this wonderful mother, the cow, which has been built up by the devicement of God Almighty and He is the greatest architect that ever has attempted such work. He has made that in such a manner that it becomes as mysterious in its action as the blood from which it is taken. Now, how can a man interpret this wonderful mysterious compound called milk, if he comes to the proposition, say of $1,000 worth of butter, with only fifteen cents worth of brains. It can't be done. I have just dropped in these thoughts with an idea of stirring you up a little, not adding anything to your information, but we want some discussion on that question of salting butter, and I see my friend Gilbert has come in. He is one of the butter instructors of the state of New York, and I am sure knows all about it. Now, ask him questions.

Mr. Favill — Mr. Gilbert, what is your practice in salting butter? How do you salt it?

Mr. Gilbert — On the butter worker, and I do it there because I can control it better. I take it out of the churn when it is about the size of grains of wheat and smaller, then I add my salt to it and stir it for a few minutes. I get better results than to stir it in the churn. I know what I am doing all the time, and I get a uniform quality.

Mr. Gurler — What is your objection to salting it in the churn?

Mr. Gilbert — I don't know as I have any objection. But I can make the butter that suits me the best and keep control of it. If you salt it in the churn you have to take it out on the worker any way. You can get at the weight of it better, too. By taking it out in this manner while it is dry, we can get the salt in thoroughly, and then work it to suit.

Mr. Favill — You don't mean to say you have it dry.

Mr. Gilbert — I work it so there wont be to exceed 12 per cent. of water in it so that when I work it, it has a grain, between iron and steel a fine grain.

Question — How much salt do you put in?

Mr. Gilbert — It depends on the customer. Some don't want any. The average customer takes about three quarters of an ounce.

The Chairman — Can you salt butter properly with common barrel salt?

Mr. Gilbert — It is a good many years since I have tried it, and quit it because I couldn't do it. I want the very best quality of salt.

Mr. Coburn — Don't you have to handle your butter more where you salt it on the worker, than if you salt it in the churn?

Mr. Gilbert — I dont' know as I do. I leave the last washing in the churn and skim it out with a hair skimmer. Then I stir my salt in and work it immediately.

Mr. Noyes — Do you work it once or twice?

Mr. Gilbert — Once. You can work butter as fine as you please and not break the grain, and there will be moisture in it enough to dissolve the salt.

Mr. Weeks — How long do you allow the salt to remain after you apply it on the butter worker, before you pack your butter?

Mr. Gilbert — I pack my butter immediately. Sometimes it stands ten or fifteen minutes before it is packed.

Mr. Noyes — Do you put any water on your butter to help work it while you dissolve the salt?

Mr. Gilbert — No, I put it right into the box.

Mr. Bingham — I think you can control the temperature better in hot or cold weather by salting in cold water.

Mr. Gilbert — In cold weather I warm it up to about sixty degrees with lots of water, and in warm weather it depends a good deal upon the day. You can't make any rules for that.

Mr. Noyes — What temperature do you churn?

Mr. Gilbert — That depends upon the cream we are handling. We are churning at seventy now, have been for the last few months, and get good results.

Question — Are your cows new milch-cows or strippers?

Mr. Gilbert — Both.

Question — What does your butter milk test?

Mr. Gilbert — The richest butter milk I have tested in six months has been .4 of one per cent. If I can't churn in forty-five minutes, I raise the temperature till I can.

Question — Do you have any trouble in drawing off the butr milk when you raise the temperature?

Mr. Gilbert — Yes.

The Chairman — Sometimes in churning there will be this difficulty. The granules will draw off with the butter milk. Did you ever try churning in strong brine to collect all the granules and thereby prevent that waste?

Mr. Gilbert — Yes, I stop the churn when I am churning at a high temperature as soon as it breaks under the glass. Then I throw in cold brine and do not agitate my butter again, until it has cooled down below 55 degrees.

Question — Then you do not draw your butter milk right away?

Mr. Gilbert — Yes, I draw it immediately after I rinse it down. If the butter milk don't draw, I give it one or two more turns with the churn.

Mr. Coburn — If you don't let the air in at the top of the churn, can't you draw the butter milk all out without any trouble?

Mr. Gilbert — There are so many different conditions in churning. I first draw the butter milk, and wash my butter when the grains are no larger than a mustard seed, and draw it very fine.

Mr. Coburn — Now, if you wash that butter with very cold water, ice water, then you add your salt in the churn and mix the salt, and the grain being hard, wont you handle your butter less and work it less to get it right into your package than to take it out onto the butter worker?

Mr. Gilbert — I think not.

Mr. Gurler — I understand, Mr. Gilbert calculates to get the salt mixed with the butter in the granular form before it is packed. If he does that, it don't matter whether it is before it is taken from the churn or not.

Mr. Favill — The last butter I made I churned about sixty pounds at the time, and I always salted it in the churn.

Mr. Monrad — When you churned at seventy degrees, did you feed any cotton seed meal?

Mr. Gilbert — Yes, sir.

Mr. Gurler — What breed of cows have you?

Mr. Gilbert — Jerseys.

Mr. Gurler — Do you think that has anything to do with the tempreature, can you churn at a higher temperature?

Mr. Gilbert — Yes I think you can.

Mr. Monrad — Feeding cotton seed meal you can always churn at a higher temperature.

Mr. Adams — I see one of the oldest and most experienced butter makers in the state of Wisconsin. We would like to hear from Mr. R. S. Houston.

Mr. Houston — When I used to make butter, I did very much as this gentleman does. We used to bring our butter into fine granules, and wash it, dry it off and take it onto the worker and work it with a lever, a common-sense worker and pack it immediately. We used to churn at about sixty-five degrees, a little warmer in winter than in summer. We use cold water to wash it off, put it onto the worker and worked it and packed it immediately.

The Chairman — There is a very nice point here, and that is the question of the relative tempreature of churning in proportion as the cows have been long in milk. We hear people talking about churning at sixty-two degrees. I was surprised in the south to find that they were obilged to churn at seventy degrees, sometimes as high as seventy-two degrees and I couldn't understand it until I found that they were feeding so largely of cotton seed meal that it produced a condition of the cream very similar to that to be found in cows that have been say eight or nine months in milk, and I would like to have some experience on that line. Prof. Roberts, of Cornell university, has just come into the room. Professor will you stand up and let us have a look at your fatherly old face?

Prof. Roberts — I am very greatly pleased to meet with you. I have come a long way. I have been in your state before, and I cannot help but admire the people of Wisconsin, although of course, there are some things to criticise. I notice you are somewhat different to what we are in New York. We are too close to the machine that makes the president now, you know.

We can't attend much to the cows. We have at least twenty men who would like to be nominated for the presidency

in our state. You must know, we are the empire state. More than that, we have a railroad train that starts at New York and after it gets out of the suburbs, it makes a mile a minute through our great state, including stops, and we are very proud of that. But we are prouder still of some of our dairies, because we have a few, they are only a few, I can almost count them on the fingers of my hands, throughout the state that are managed by live men. But it is wonderful, yes, it is a wonderful thing, Mr. President. what one man can do. One man takes the horns off a cow way out yonder in another county, and low and behold, it is not two weeks before they are sending for an expert all over the state. One man buys a little separator, or a big separator, and immediately the letters come into our office inquiring, "How many cows must I have before it will pay me to get a separator?" And the first thing we know five or six of these little separators are being sold in that neighborhood. We are now holding a series of institutes in the school houses of some of our counties on Saturdays, and the most successful work that we have done this winter, I think has been to get from forty to fifty farmers in a school house and talk to them and let them do a good deal of thinking

Now, on this butter question. Haven't you all got to learn, each one for himself, what temperature to churn? It seems to me there is no standard at all, only, probably, within forty-eight and seventy, according to the time, according to the atmosphere, according to the coldness of the floor, according to the hardness of the churning, and according to whether you want to churn clean. We find that if we churn too soon, and have the butter come to thickly, we are not apt to churn the butter all out of the butter milk; whereas, if we churn longer, we are more likely to churn the butter all out of the cream. Another thing. We are trying an aerator, which cools the cream to sixty degrees, and we find that the milk that is cooled down is creaming sooner than it did before we cooled it in that way.

THE CITY MILK TRADE.

HON. H. C. ADAMS, MADISON, WIS.

There are 800,000 people in the cities and larger villages of Wisconsin. They consume each day 200,000 quarts of milk. Milk sold to city and village customers brigns an annual revenue to milkmen and middlemen of $3,600,000. The sweet cream trade is worth at least $400,000 more, making the total returns of this branch of the dairy business $400,000 each year. The subject is worthy of the attention of this convention.

The milkman has been the victim of more diluted and warmed over jokes than any created thing except a lawyer. He can stand it pretty well for, like a lawyer, he gets paid for his work and has that easy philosophy which is seldom divorced from a well-filled pocket book. The consumption of milk is rapidly increasing. Outside of babies it is becoming quite a fad to drink it. It gives more comfort than tea, more strength than coffee, more flesh than beer, more nerve than wine and more sense than whisky. It is said to take up germs of disease and transmit them to human beings. So does water and air, kisses and candy and a lot of other things that the world must have. The healthiest children on earth drink nothing but milk until they are twenty years old, and then keep up the practice until they are eighty, and are children still. The paragrapher thinks it funny to link the milkman and the pump together, but the children of Israel wandered forty years in the wilderness looking for a land that was full of milkmen and bee-keepers and the world thought for ages they were after a good thing and it looks so now more than ever. Charley Beach and a hundred other philosophers have demonstrated beyond question that we can get more nutrition out of a cent's worth of milk than two cent's worth of beef, and any fool even a man, can put it on the table in shape to be eaten. It is the best medicine when hot, and the best food when cold, known to men. Sweet cream will cure more consumptives than cod

liver oil and skim milk will make stronger and healthier children than oat meal. Outside of the city of Milwaukee, milk for family use is generally delivered directly to the consumer by the producer. This is not practicable in very large cities where supplies must necessarily come from a distance. In those cases the profits of the dairymen largely disappear in the well regulated maw of the dealer's unions which fix prices. The milk producers having the instinctive antipathy of the farmers to combinations in their own interests, do not hang together and the result is they hang separately on pegs of low prices fixed by the middlemen who do hang together. The milk supply of Wisconsin cities is fairly good so far as per cent. of butter fat is concerned. The report of the dairy commissioner for 1890 gives some analyses showing a range of averages from a little over three per cent. in Janesville to nearly four and one-half per cent. in the dairies about Madison. As a matter of fact milk for city trade is seldom watered and rarely skimmed, except in Milwaukee, and there the evil has been largely abated by a vigorous enforcement of the present law on the subject by the dairy commissioner. When poor milk is supplied, the cow and the feed are generally responsible. Ignorance, stupidity and carelessness do more harm than skimmers and water. It is a common blunder for men to say of certain cows and breeds of cows, "They are not good for butter, but are good in the milk business." The good butter cow is good everywhere, in the milk trade as well, as for the creamery. Good cheese on the table is eaten and makes a market for more; good butter goes the same way with the same result, and good rich milk not only gives satisfaction, but increases demand. The milkman with the poor cow is laying the foundation of success for his competitor. It is also a blunder to imagine that quantity and quality of milk have been eternally divorced in a cow. Richness and quantity of yield go together in the best dairy cows; not always, but often. I have tested cows in my own herd and found the cow giving 35 pounds per day, yielding over 5 per cent. fat, and cows yielding 15 pounds testing four percent., and I found further that the average of all the large milkers was richer than the aver-

age of those yielding a smaller quantity. The milkman having a well selected lot of cows can build up a business anywhere if the cows are handled right, and he knows how to deal with men and women. Feeding, care of product, delivery and business methods must be studied. The city trade wants color, richness and sweetness in milk and cleanliness always. The milkman has not one taste to satisfy, but a hundred. If he can satisfy one correct taste he can exercise his diplomacy on the rest. Milk made from marsh hay and distillery grains will never suit anybody, who knows what milk should be. It is white and a long way from the rich breath of fragrant meadows. Distillery grains may be fed with corn and oats in good proportion and not noticed. Malt sprouts, dry and sweet, can form 30 per cent. of the grain ration with good results, but if you want the best winter milk that can be made, feed corn fodder well cured in the silo or out of it with a fair crop of corn on it and from eight to fifteen pounds of oat meal each day. Of course, clover gives more color and sweetness than timothy and in the season pumpkins are superior to anything in producing these results. Middlings and corn meal in equal parts make an excellent grain ration. Monthly changes from one good grain ration to another of different composition is always appreciated and paid for by the cow. When we have good cows well fed, the question of good milk production is only half settled. Stables must be clean, warm and well lighted. A cow does not give good milk in a dungeon, an ice house or a hog pen, she has eyes and sensibilities and repays regard for them by the character and quantity of her milk. Milk is always hungry for bad odors, and when the stable is full of them, it samples all of them to the disgust of the buyer. Let a pail of milk stand in a foul stable ten minutes and its character is gone forever. If the purchaser of city milk could see 40 per cent. of the stables in Wisconsin from which their supply comes, their stomachs would make more revolutions in a minute than a Danish-Weston separator under a full head of steam. The dairy commission of Minnesota is inspecting the stables of milkmen of that state and publishing their condition. It is effect ing a revolution in the matter. A law should be passed in Wis-

consin giving the dairy commissioner authority to do similar work with power of condemnation of disease-breeding stables. In some of the cities of Canada milkmen are required to take out a license; the standard of butter fat is fixed at 3½ per cent.; the dairies are inspected twice each year and the results of examinations published in the newspapers. This system is productive of a good, rich, clean milk supply. In a clean stable we want a clean cow. The curry comb and brush have a place in the cow stable as well as in the horse barn. The average Wisconsin cow comes out of the stable in the spring looking as if she had alternated for six months between dust baths and others not so pleasant, and it is generally the middle of May before the spring rains have made her presentable in good society. The milker who is smart enough to get clean, wholesome milk from an animal in this condition ought to put himself in the hands of his friends, for he is bright enough to be electd to any office on any tickt. The milkman should give his cow a thorough grooming three times a week, and six would be better. It not only makes clean milking possible, but the cow likes it; it makes her feel comfortable and quiet and saves the time and energy that she would otherwise waste rubbing against a post. The cows udder should be brushed before milking, not washed. The washing should be applied to the hands of the man who milks her, before he begins. These may be considered small details, but they are important. Milk should be strained at once into a tank holding at least forty quarts, with a faucet one inch from the bottom through which the milk should be drawn into the delivery cans or bottles, as the case may be. Two wire strainers, one inside the other, and at least eight thicknesses of muslin should be used in straining. When in the cans the milk should be cooled at once in cold water with the can covers tilted to facilitate the process. Night's milk for morning delivery should be turned over at least twice before the wagon starts to mix the milk. It should be turned over again before it reaches the customer. The system of delivering in bottles is undoubtedly the best. Delivery in large tanks is an abomination. Eight quart cans answer a good purpose. The milkman who succeeds will milk his cows at the same time

each day and seldom or never vary the time of delivery. His customers will appreciate regularity. The man who delivers the milk should look like a business man, and not like a tramp. His appearance should secure him from attacks of well regulated dogs and win him the favor of that modern autocrat, the American hired girl. He should know enough to give to every man his due and to every woman a little more. He should be as honest as Hoard, as industrious as Curtis, as bright as Beach, as determined as Thom, as genial as Favill, as smart as Prof. Henry, as modest as Fargo and more mindful of the proprieties than the writer of this paper. The milk business conducted in the manner outlined will pay. Its profits are more than double those of a butter dairy. The average price of milk in Wisconsin at retail is five cents a quart. A man of sense can select cows in this business that will average 3,000 quarts per year. This will make the gross income per cow $150, delivery of milk and care of stock will cost $50, and leaves a neat return for each cow of $100. This is worth milking for. But the business has its unpleasant features. It never lets up. Its annoyances are without number. Customers are as full of fancies as milk is of butter globules. The milk must be delivered in rain and snow, amid heat and cold; Sundays are obliterated. The early morning hours that are golden for sleep must be spent in active labor. Rest with the milkman becomes a memory and a hope. But if he wishes to trade comfort for money this business gives him his opportunity.

DISCUSSION.

The Chairman — Mr. Adams said you could put the faucet about an inch from the bottom. You can put it into him wherever you are a mind to and draw from him all of the richness of experience he has.

Mr. Thorpe — I would like to ask him why he has to strain through so many thicknesses of muslin?

Mr. Adams — There is a little prejudice among a few of our customers in the city about having hairs in the milk. Of course,

I don't think they ought to mind it. It would be a good deal easier and save some expense for strainers, and a little time to pour it right into the cans, but there is that prejudice existing and, of course, we have to cater to it.

Mr. Thorpe — How much do you strain through that one strainer without washing your strainer?

Mr. Adams — Well, we generally put through one milking, all the way from ten to forty-six cows.

Mr. Thorpe — And if there are hairs on anything in the first pail of milk, you wash those hairs with the rest of the milk?

Mr. Adams — Of course, to be serious, I do not pretend that this system is prefect. We never will get perfectly clean milk, until we get this perfect hired man that we are looking for, and the perfect man who is over him who is not always on hand. In any ordinary dairy, it is almost an impossibility to have your milk perfectly clean, and the strainer certainly takes out a portion of it.

Mr. Thorpe — I have often seen farmers, in milking, strain all the milk through one strainer, without rinsing. Now, in that case, the last milk must run through quite a quantity of dirt. I have a pump right near where I milk, and my practice is to have the strainers washed out after every two pails of milk.

Mr. Dennison (President Iowa Dairymen's Association) — I would like to ask Mr. Adams what is the minimum per cent. of fat that should be allowed?

Mr. Adams — Our law here uses a three per cent. standard. It is questionable whether that is high enough. In the report of the last dairy commissioner I think there were analyses of 500 cows, and nearly half of them run under 3½ per cent. In Minnesota I understand that the standard is 3½ per cent. As I stated, however, we find that in Madison, where I live, we have a remarkably high average, or had at the time tests were taken from fourteen dairies.

Prof. Roberts — Is it not feasiable in the better future to have every delivery wagon carry a placard telling the amount of butter fats that he gives.

Mr. Adams — I think it is, and I think that would put the

business on a more business like basis. Prof. Roberts — I think so. Now, with our tester, there is no trouble of keeping within one at least quarter of one per cent. of the proper amount of butter fat. We buy commercial fertilizers in our state which are guaranteed to have a certain per cent. of soluble phosphates. Now, if they can come within a half per cent. we can come within a quarter per cent. in milk. I hope you Wisconsin people will have such a law soon and compel a man to carry a placard and make tests every day. I want to give you a bit of our experience which confirms what Mr. Adams said, as to the fact that you cannot get good milk from poor cows. Two years ago, in order to conduct some experiments, we went out and bought a couple of cows, and we could just barely get them home. They were in very poor condition, fresh cows; we named one "Shade," and the other "Shadow." Those cows were fed grain on pasture, with some of our own that had been considerably better wintered, in order to determine what the effect of feeding grain on pasture would be.. The fat in those cows milk was determined all summer long. This last summer we had the same cows treaed in the same way, but they came into milk, fleshy, in good condition, and they have averaged within a small fraction of one per cent. more butter fat this last year than they did the year before, and they have also given a considerable quantity more of milk, being fed in the same way.

The Chairman — They came to you starved out?

Prof. Roberts — And we conducted experiments with them all summer, and then wintered them, and in order to carry over another summer, we bred those cows, kept them, and this year I think it is 20 per cent. more milk they have produced than they did last year, and almost one per cent. more of butter fat.

Mr. Favill — The first summer did they have grass all summer?

Prof. Roberts — Yes, sir.

Mr. Gilbert — Was that caused by feed or breed?

Prof. Roberts — It was the same cows. I give this for what it is worth. We fed them grain all summer long and the butter fats rose all the time. They started at about three per cent. and got up to considerable over four per cent. We

averaged the butter fats of a year ago and then we averaged the butter fats of this year.

The Chairman — The idea is that you took a half starved cow and she gave half starved returns. When she had been with you long enough, to come to a Christian condition, she gave Christian returns.

Prof. Roberts — We made this experiment to see if that poor cow would respond better than our fleshy cows did, to the grain ration on first class blue grass pastures. We bought the two and kept them over a year and tried it over a year and tried it the sceond time, and we did not get such results as we expected. So this year we have gone out and selected a large dairy of cows that were thin in flesh and have duplicated this experiment. I will say we always feed grain in the summer, although our experiments show we do not get full pay for uor grain.

The Chairman — Taking the year through, do you get paid for your grain?

Prof. Roberts — There are two or three features there that you cannot measure by the scales. This experiment shows that we improved the cows.

The Chairman — Prof. Stuart showed how, by improving the feed, he could improve the butter fat of a cow in two or three years.

Prof. Roberts — Yes. Smith and Powell made a butter test of their entire dairy for a year for butter and when you talk to them that you can't increase the per centages of butter fats in milk they just kind of put their hands up that way and laugh.

Mr. Adams — That is the way John Boyd acts.

Mr. Bender — It seems to me that a cow in average flesh in he spring, will go into winter quarters in better condition if she is fed during the summer. I think it pays me although the porfessor says it did not pay them fully for the grain fed during the summer.

Mr. Adams — I think that that statement might be modified some. I have found this, that it did not pay me to feed good milch-cows grain during the early months of summer, when

there was a good, rich and abundant supply of grass. I found that it did pay when that food became inferior or short in quantity to keep up their milk flow by grain or some other means. It must be kept up because if you do let it drop down along in the latter part of August or September, you are going to waste a very large amount of grain in the early winter trying to get back that to the former yield, and very likely you will never do it.

Mr. Favill — Just at the time that you dropped off your grain, when there was plenty of grass, is just the time you ought to have kept a little up.

Mr. Adams — I think if a cow has good rich, abundant pasture, it is a relief to her to drop off for two or three months.

Mr. Gurler — I agree with Mr. Adams. I believe that on the whole the cow will make him more money to leave the grain away from her two or three months in the early summer when there is good pasture.

Mr. De Land — I have had stock for agood many years, and I have experimented in many ways. It is common for farmers to say that when there is plenty of grass, it don't pay to feed. Many times, when the feed is short, they say it don't pay to buy bran. I made an experiment several years ago. I took fifteen cows in one stable, and fifteen in another. I weighed the milk before commencing the experiment a few days and I commenced feeding to see whether bran would pay by feeding to one side and not to the other. I found by that experiment, continuing two or three weeks, that there was no perceptible effect, no difference between the two stables, but that proved nothing; it was no experiment at all. Since that time I have found by continuous feeding that it did pay to feed, and it paid to increase when your feed began to get short, but I always feed every month in the year some grain feed, except when the animal is dry.

Mr. Boyd — I feed grain every day in the year, and I have arrived at what seems to me, to be a satisfactory solution of this question, and that is this, that when the cow is fed on full pasture, she eats all that she wants of a perfect ration, and the extra feed that she gets only prevents her from eating so

much of the grass as she would otherwise secure. If the pasture is short, you will very soon see the difference if she is fed grain.

Mr. Sawyer — I would like to ask the professor on the same point we have been talking about, whether an increase in the per cent. of butter fat can be put there with grain or anything else when you have a cow in good condition?

Prof. Roberts — Our pastures are permanent blue grass pastures, on a side hill. Those pastures have been fed manure until they produce about twice as much grass as the average pasture. Our cows are fed well and our dairy runs the year around, I generally try to have most of the cows drop off their calves in the fall. They are selected cows. Now, you have the conditions. We went to work feeding grain in our pastures, and when we got through, we found that the butter fats, taking the ordinnary price of butter, had not paid us for our grain. That was the first year. Our cows went into pasture and good pasture. Then the next year we bought "Shade and Shadow" and put some of our cows with them, and made two groups of them, and also kept "Shade" and Shadow's" milk separate from the others. The cows went into the same pasture and were again fed, part of the time hay was mown and carried to them. Then again, we failed to get quite paid for our feed. Of course, I mean in milk and butter. In the mean time, we discovered, as I told you, that "Shade" and "Shadow" had increased the butter fats in their milk almost one per cent. Yet, we did not like the experiment altogether, and so we went off and took a Jersey herd this last year, and tried them under conditions that we thought were normal for the state. Our pastures were fairly good, and yet we don't feel that it pays. By and by we will get our figures together, we, in New York, and you, in Wisconsin, will add yours to ours; we will see what our conditions are, and after a while we will getat the truth. This last experiment with the sixteen cows was away from home, managed by an expert in a dairy. Along in the fall we commenced to feed turnips, but they began to run down. Before that we had been feeding millet, and then corn. One group had risen up above the other in butter fats, then

this corn fly came and they began to run down, and we began to feed them turnips. The quantity of milk went right up, but the butter fats went down. The bulletin, giving this whole experiment, is just out, and you will have it at your own station in a few days.

The Chairman — You remind me of a remark my father used to make. He was a very wise man with the cow, and he said he had always noticed that if a cow go into a habit of losing butter in her milk that it was a mighty hard thing to stop the habit, and he was very watchful lest that habit of declination should be formed, particularly in the summer time when the food began to get dry and natural shrinkage took place.

Prof. H. H. Dean — I would like to say a word or two along a couple of lines touched upon here. On Monday I was called to the eastern part of Ontario to hold a meeting with a view of establishing a creamery and cheese factory to run the year around. A man who was taking a leading part in that gathering invited me home to dinner. He keeps about twenty-five cows and I went out to see them, and I was surprised to see the amount of filth attached to those cows. The practice we adopt is to shear the hind quarters of the cow with an ordinary horse clipper, and it makes it much easier to keep her clean. As soon as the cows come in in the fall, we clip their hind quarters. Now, on the point of straining milk. During last sunmmer I found a great deal of difficulty in getting it properly strained. Our plan is to take an ordinary milk strainer and then take muslin and you know there is usually a ring at the bottom of these strainers, we put on five or six thicknesses of muslin, and a ring over it, and it makes a handy and complete strainer. Now, on the effect of feed on milk, I conducted some experiments. I took three rations; the first was a ration of oat straw, hay and ensilage, the second was hay, corn meal, pea meal and oat meal; the third one, hay, linseed and cotton seed meal. I took those cows and put them into three groups, fed two of them on oat straw hay and ensilage, a ration which Prof. Cooke said was a starvation ration. I fed them that four weeks, then changed them to a rich ration of hay, cotton seed and linseed meal and

from that onto the other, and the cows, all of the lots, gave practically the same percentage of fat in their milk. Now, that was the result of my work last year. It was but for a short time, they were only fed for four weeks on this ration, but I found very little difference, in fact, the cows gave practically the same amount of milk, no matter what rations they were eating.

The Chairman — Gentlemen, you see what a wide variability there is in the experiments and conclusions. You know what the old darkey said when the preacher said that those who trod the narrow way went down to perdition, and those who trod the wide way went down to Tophet, and the old darkey looked the thing over and said he guessed he would take to the woods.

Mr. Bender — Did you find any difference in the condition of those cows that were fed on that starvation ration? How did they come out after the month's experiment?

Prof. Dean — They lost a great deal of flesh and they gave a good deal less milk.

Prof. Short — We have been hearing a good deal about the percentage of fat in milk on different rations. You know in this state we have had a very dry summer. Not far from Oshkosh I have seen milk that came to a factory and found it very low, about 2.6 or 2.7. Of course, they said it was owing to the poor feed. I found that some of those cows had been running on pasture and the pasture here was about as poor as could be, and the cow lived. Then I saw others that were in pretty good condition, but only giving from one to two pounds of milk, but the milk was 4½ per cent. of fat. I have seen a cow living in that way on a bare maintenance ration that gave ten pounds of the very poorest kind of milk, frequently down to 2 per cent., at the same time, or herd of cows, that got just enough to keep them going, average one to two pounds of milk, but the milk was 4 per cent. and 4½ per cent. of fat. In this matter, I think it is very important to know something about the amount of milk that was given, whether when the per cent. of fat in milk increased, the amount of milk does not go down. Dr. Armstrong carried on various experiments, and he never

could make more than from two to three tenths difference in the fat. He found that when the percentage of fat went up the amount of milk went down.

Mr. Adams — I do not believe that it is possible to so feed a cow that you can change the ratio of the butter fat in that cow's milk, and the other solids.

Prof. Short — That is a very wide question. There is no doubt that when the amount of fat goes up the amount of caseine goes up very slightly. Very rich milk contains a slightly less amount of caseine than poor milk. The difference is in the butter fat; that will jump up and down. I have seen the same cows under exactly the same conditions, so far as feed, water and temperature are concerned, give a difference of one per cent. between milkings.

Mr. Monrad — It seems to me that this discussion is rather scientific and I feel inclined to remind you of our worthy president's remark that the inside of a cow was the darkest place he knew of. My experience has been mostly on pasture, and I got pretty good milk on it but I want to ask these gentlemen if this whole thing is not reduced to a question of giving the cow good heathy food in sufficient quantities, and giving her some variety in the food. Another thing, that the whole question of feeding animals depends upon keeping a watchful eye on the healthy condition of the cow. There are many cases where our practical feeders, and especially our practical breeders have shown where they have increased the fat for a day or two for a short test. We can easily understand how that has been. The cow has been out of health. It has been in a feverish condition, and I would like to hear whether, after all, we ought not to come down to the fact that a man who is feeding cows should watch the health of his cows and at the same time have an eye over each individual cow, from which he will receive various returns for his feed. We cannot lay down any rules. Each cow has an individuality, just as feed has one effect on Bro. Thom, and another on Bro. Adams, so there is a difference between animals, and I look upon these experiments at our stations with a little suspicion in so far as they are doing it with too few cows. An experiment with one or

two cows is like the swallow that don't make a summer. We used to say when I learned to make butter in Denmark that we could not make rich milk unless we fed lots of grain, and also that if we fed turnips or roots, we were bound to get poor milk. Well Prof. Fiord went in and took four different herds in different places in Denmark under different conditions, a herd, I think, of twenty-four cows. He gave them certain kinds of grain feed and the cows gave a certain amount of milk with a certain per cent. of fat. Then he substituted part of the grain fodder with turnips, and he proved in a practical way, done on the farm, under conditions, such as farmers have that the percentage of fat did not decrease by the substitution of turnips. Prof. Roberts' two cows were not in good condition. The grain feed they got to start with, went to building up the system that was starved out. Each cow certainly has a limit.

Prof. Roberts — I think my experiments not fully understood yet. These cows were fed a year, and became in good flesh in four or five months, and the figures are based upon an average of the butter fats for a whole year. I know of no experiment in this country or in Europe that has extended over so wide a period of time to prove or disprove that thing. More than that we have tried feeding a month, eight or ten years ago in groups of cattle to see if we could change the butter fat, and we could not do it in a month. We tried it with over 100 milch cows.

The Chairman — I guess it is safe to feed well anyhow. I think the professor's peculiar milk could be explained. One set of cows were in good flesh, the others were not; they had less maintenance ration and were drawing on the fats of the body, they got to making good milk and they couldn't stop it, like all good Jersey cows.

BUTTER MAKING ON THE FARM.

CHARLES THORPE.

When I was about fifteen years old my father didn't know what to do with me and he took me to a phrenologist and had my head examined to find out what vocation I could best follow. It so happened that the day before this I had been quarreling with the boys and I got a bump on the northeast corner of my head that raised a lump as big as an egg. The phrenologist felt all over my head and struck this lump, and he said, "Mr. Thorpe, you certainly ought to make a farmer of this lad, for I find his agricultural bump extremely well developed." That was all father wanted, and he sent me to work, and so I grew up until thirteen years ago found me on a farm stocked with two cows and one hundred sheep. I haven't a word to say against sheep in the hands of the right man, but I soon learned that the only regular income I had was earned from those cows, and it occurred to me that if I had enough I might make money enough to run the farm. So the cows were purchased, and from that time on we certainly increased the number of our cows, and diminished the number of the sheep, until we at last got into the dairy business. Up to this time we had been having private customers for all our butter at twenty-five cents a pound by the year, and when we would take a customer, the agreement would be that he should have so much butter per week or month for the year, and to show you how all people are apt to keep a verbal agreement I will quote from a couple of the many letters we received from twenty letters we received from private customers. In the winter time we would receive a letter something like this:

"CHICAGO, Ill., December 15th. — Mr. Thorpe: Please send us another jar of butter at once, as we have had lots of company and our butter is gone."

And, of course, although it was not time for perhaps a week or ten days for his jar of butter, we would send it as soon as possible. When summer came, we would get a letter something like this:

"Mr. C. Thorpe: Send no more butter until further notice, as we are going to spend a few weeks in the country."

And the butter that should have gone there for the next two or three months at twenty-five cents a pound was sold for what it would bring. So we soon got tired of a private customer business and went to Chicago to a commission house, and we have found that the best practice. It was the height of our ambition for sometime to get so far into the dairy business that we had to churn every day, but when we got there and I had to do the churning, somehow it was not so pleasant. So I went off and got some lumber and in due time set up a dairy building that was equalled by few and surpassed by none that I have seen, and from that time on the old horse has done the churning, and we have looked forward to churning day about as we looked forward to Fourth of July, when we were boys, and the anxious look that used to be on Mrs. Thorpe's face has left it, and I don't believe it will return until she gets her second husband.

DISCUSSION.

The Chairman — You have given us quite a humorous statement of your experience, but we would like to know something of your method. How many cows have you?

Mr. Thorpe — I am milking twelve this winter.

Mr. Adams — Do you know what the average price of your butter was during the year?

Mr. Thopre — Last year it was 21½ cents, net.

Mr. Morrison — What is the average of your cows?

Mr. Thorpe — Three hundred and eight pounds, five two-year-olds included in the average. They are going to do better this year though.

Mr. Favill — How are you going to do better?

Mr. Thorpe — The cows are a year older, and I am a year older.

Prof. Roberts — Do you feed grain on pasture?

Mr Thorpe — Yes, sir.

Prof. Roberts — How much?

Mr. Thorpe — Well, enough of it to milk at night.

Prof. Roberts — What kind of grain?

Mr. Thorpe — Well, I feed generally shorts, some ground oats and shorts mixed.

Question — How many months do you expect to milk your cows?

M. Thorpe — About ten, ten and a half.

Question — Do you make the larger part of your butter in summer or winter?

Mr. Thorpe — I make the most of it in winter.

Mr. Favill — Why not let the cows go dry while that fellow goes to the seaside?

Mr. Thorpe — Well, they don't go dry. I like to have my cows come in after they are off the pasture. I find if they come in on pasture, it is very hard to keep up the flow of milk during the time they are changing from the pasture to dry feed, and if they come in in the fall after they are off the pasture, you can easily keep up the flow of milk through the winter, and through the spring when they are turned out onto the pasture.

Question — Do you think you can get more butter from cows that are bred that way, to come in in the fall, than if they are bred to come in in the spring?

Mr. Thorpe — Yes, you can get it when butter is the highest, and I think you get more butter.

The Chairman — Can you give us any idea about how many pounds of milk it took to make a pound of butter?

Mr. Thorpe — Yes, I think I can. I had the figures for last year in a book which I forgot to bring with me, but for the month of January, last month, the average was seventeen pounds of milk for a pound of butter.

The Chairman — Taking it for the entire year, what would be your judgment as to the number of pounds of milk to a pound of butter?

Mr. Thorpe — I could tell exactly with my papers , but it was somewhere in the neighborhood of twenty pounds last year

Question — What are your cows?

Mr. Thorpe — Grade Jerseys.

The Chairman — That would give you 1,660 pounds of milk per cow per year.

Mr. Weeks — What feed did you give your cows during the month of January?

Mr. Thorpe — I gave them 80 pounds of middlings and 24 pounds of oil meal divided between the cows, and about 36 pounds of ensilage apiece, and a few pounds of hay and straw cut together. I do not figure up the roughage at all. I claim that the skim milk and the fertilizers are worth all the roughage that we can figure on the farm. For the thirty-one days of January I have 443 pounds of butter from 12 cows.

Mr. Sawyer — Do you use a separator, or set your milk in water?

Mr. Thorpe — I set it in water. It took 7,387 pounds of milk to make that 443 pounds of butter, at twenty-five cents. It amounted to $111.75. The feed was $25.75, which leaves a net balance of $86 and some cents.

Mr. Sawyer — Do you think you can change your rations so as to bring your average yield from 20 pounds of milk per pound of butter down to 18 or 16?

Mr. Thorpe — Some months it will go below that and other months higher. I think it is owing to the feed, although they are well fed every day of their lives. It takes more milk when they are fresh. I attribute the difference a great deal to the weather.

When I get my farm arranged as I expect to some day, my cows are never going to be out in the day time in fly time, they are going to be in a darkened basement, and out in the pasture at night.

Mr. Thom — I wish to say that one winter I was milking forty-six cows and producing between 300 and 400 quarts of milk. The stable was warm, and they were kept in the stable sometimes ten days at a time without turning out at all, and when the thermometer would sink to 20 degrees above zero to 20 degrees below I have seen them go thr ugh it without a change of fifteen puonds in the milk supply.

The Chairman — In our creamery we kept a weather record, and during the changeable time of the year, for instance, in the

late summer and early fall, when almost every farmer in the whole range of patrons thought it would be foolish to pay any attention to his cows, if a cold rain storm came up, this weather record followed exactly the shrinkage of milk. For instance, if a cold rain storm came to-day, to-morrow there would be a short supply of milk, and you could follow every storm along that fall just that way, and there would be a very perceptible loss.

Mr. Phillips — I don't calculate to have my cattle out in cold storms, and I feel sure that the effects will show, but what I was referring to was a different point. Sometimes the weather is a great deal colder and you can get more cream out of the same amount of milk, and, of course, get more butter; in other words, it wont take as many pounds of milk for a pound of butter as in hot weather.

Prof. Roberts — We had that trouble, although we watched them very closely. A cold wind from the lake, without any storm at all, cold nights, the ground a little damp, would affect our daily reports. We found that just a few degrees in the temperature of the ground would affect the supply.

The Chairman — I have no doubt that thousands and thousands of dollars have been wasted in Wisconsin this past year by inattention to just one thing. It will pay to develop thought and study this question and I believe it will pay millions of dollars and that is one of the things we are here for.

Mr. Weeks — Does not all this discussion tend to show that on the whole it is better to keep the cows in the stable most of the year to get the best results?

(This question was answered by a chorus of "Yeses" all over the room.)

Mr. Phillips — There is a man in my neighborhood who generally buys about thirteen bags of bran for fourteen cows, and if he has a bag left in the spring, he thinks he has wintered his cows economically, and his wife told at our house that they knew that all they got from their cows was clean profit, because they never fed them anything.

Mr. Rawson — I have had a little experience in feeding cows in the barn, and I know I kept up the flow of milk this last

summer a great deal better by letting them out to exercise. I put them back in the barn after they have been out with the windows darkened during fly time, and it is astonishing how quickly they come back to the barn after they are watered. One time the door was left open and I went out to see what they were doing, and, with very few exceptions, they were in their places in the barn. They evidently preferred it.

Mr. Phillips — How long have you practiced keeping your cows in the barn in the summer time, and how do you manage to soil them?

Mr. Weeks — My first soiling crop is rye. As you all know we had a very dry spell, and I had but little pasture, and had to depend on the soiling crop. This rye just helped me out till the clover came on. I had ensilage left and with that and the rye and other mill feed, we got on first rate. Then came the clover and I kept feeding that right along. This ground had been topped and dressed the year before, and there was a good second crop by the time the oats had been cut off, my second crop of clover was ready, and I fed that for a while, until I had millet, then I fed fodder corn.

The Chairman — I ride out a good deal in the summer time and I often notice the calves all over the country being raided upon by flies, and the cows the same way. I do not think we really have commenced to consider the tremendous exhaustion to our cattle from these summer flies, and I know several parties who are raising their calves, who, during the summer, pursue the same plan, which you say you do. Keep them in a dark stable, only allowing them to run out at night, and they report a wonderful increase of returns in the management of their calves in this way.

Mr. Sampson — I would like to ask the president what he thinks of dehorning cattle?

The Chairman — I think those who have read Hoard's Dairyman have a pretty good notion of my ideas on that subject. I do not think well of it.

Mr. Phillips — I dehorned mine about the first of our neighborhood, and I never saw any bad results yet.

Question —What good results do you get?

Mr. Phillips — Three hundred and eight pounds and I will get more than that this year.

Mr. Morrison — Mr. Goodrich gets three hundred and twenty pounds and his cows still have their horns.

Mr. Rawson — I have five or six calves that have never been outside of the barn unless the boys have let them out since I came away. They were kept in the barn and the barn darkened, fed in the barn and I never saw calves do better. They were as large or larger than some of my yearlings that had been out in the pasture all summer and fighting flies, and these were spring calves.

Prof. Roberts — I have been raising calves for seventeen years in the barn, and our example has spread through New York, so that I know quite a number of men who never will let their calves run out doors. A cow can fight pretty well, but calves cant. We are practicing letting the cows out at night in hot weather, feeding on a blue grass pasture close to the barn. Has the horn fly, the cause of so much trouble to us, begun to trouble you yet?

The Chairman — It has not reached us here yet.

Mr. Gillett—In connection with feeding cows in the stable during fly time, I wish to say that during the latter part of July and the entire month of August, last fall, we put several of our cows in the stable for the purpose of keeping their coats slick, and keeping them from the torture of the flies.

I believe that our cows suffered more from the intense heat of the stable than they would have if they had been allowed to run in the pasture and fight flies.

Prof. Roberts — How large was your stable and how many cows had you?

Mr. Gillett — We have a stone basement, nine feet high, 52 by 64 and there were perhaps fifteen animals in the stable.

Prof. Roberts — Have you ever figured up how many cubic of air space you have for each 1,000 pounds of animal in the stable?

Mr. Gillett — No, sir. We have a ventilator in our stable; there are windows on four sides of it not to exceed three and a half feet apart. I am confident that we would have done better

had the stable been cooler, and what I want to know is, what can we do to cool that stable. Of course, when you darken it you shut out more or less of the circulation.

The Chairman — You know the old man's wife knows how to keep the parlor cool, and she does it by darkening it.

Mr. Gillett — That is all right, but you put a coal stove in there and put a fire in it and you will warm it up about as fast as the cows warm up the stable.

The Chairman — If you had a ventilator so that you could introduce plenty of air without introducing light, it might be you could reach the condition you wish.

Mr. Bender — How could that be done on a sultry day in August when the air outside is hotter than that inside?

The Chairman — No, that is not true. The air that stands next to my face is about of a uniform heat. As soon as I put it in motion, it commences to feel cool. In cases of overheating, sun-stroke or anything of that kind, the first thing is to fan a man very vigorously, or put ice on his head. Air in motion takes out heat rapidly. The air that is quiescent and close to my face, becomes charged with the heat of my face, and when I lower it by fanning, or change it, it becomes charged again so I keep doing so and there is a constant change and a constant lowering. We can cool a room if we can only secure a current of air flowing through it, even though the air may be of the same temperature. If I had a room made so that I could secure a current of air next to the earth, I should be able to keep it cooler than I would otherwise. The induction of heat is more rapid three feet from the surface than it is at the surface. If I could open the base boards, for instance, all around the room, and could have a current of air blowing through next to the earth, and I could have it ventilated above I could secure in this way a current of air blowing through, and still keep it darkened. In constructing an ice house, if you build the house in double partitions and you make the whole length of it a ventilator. It is a double shell. The sun shining upon the outer shell warms that layer of air and causes it to rise. The moment the air is drawn in from the bottom, up it goes and pours out from the top,

and that keeps a current of moving air inside that shell, whereas, if you had one layer of boards, the sun hitting it, would heat your room inside and your ice would be all melted.

Prof. Roberts — Our dairy house is built double in that way.

The Chairman — Mr. J. D. Clapp, of Ft. Atkinson, had a cellar that he couldn't keep anything in. In some way there was always carbonic acid gas in there, and he couldn't keep milk or pastry or anything else. Prof. Wilkinson, one of the wisest old men I ever knew, says to Mr. Clapp, "I will make your cellar as sweet and clean as can be, and it will be automatically ventilated every time there is a fire in the kitchen stove," and the old man went up to Mr. Clapp's house, and he took a four-inch galvanized iron pipe and run it right down by the side of the cellar wall, within two inches of the bottom brought it up over the top of the cellar wall, turned an elbow, and run it along on top of the ground until he came to the kitchen stove. The kitchen was in an addition to the house, and there was no cellar under it, so he run it along on the ground till he came to the stove, then he run it alongside of the pipe, and passed along by the side of the stove pipe the whole length and turned it into the chimney two feet above where the stove pipe entered, so as not to interwith the draft. Now, there was a column of air all the way from within two inches of the cellar bottom clear to the chimney. Every time the girl built a fire in the kitchen stove, it heated this little column of air and that commenced to force it to rise and it carried off the foul air in the bottom, and in twenty-four hours Mr. Clapp's cellar was sweet and clean and has been so ever since.

Prof. Roberts — I want to make a practical suggestion to this young man, and that is, to double the amount of cubic air space in his stables Most of the farmers have less than a cubic foot of air space per pound of live weight of animals. If you have two or three or four feet of air space to the pound, you can keep your stables sweet and pure. Many of our New York farmers have about one quarter of a cubic foot to a pound of live weight. It is like putting a man in a box and locking him up.

The convention adjourned to meet at 9:30 A. M. the next day

The convention met at 9:30 A. M. February 11, 1892.

President Hoard in the chair.

Mr. Robert B. Kirkland, executive commissioner of the world's fair for Wisconsin, addressed the convention as follows:

Members of the Wisconsin Dairymen's association:—I scarcely know what I can say that will be of interest to you gentlemen. During my twenty years residence in the state of Wisconsin, I have been under the impression that these conventions were in the nature of a mutual admiration society. I came here yesterday for the first time and I say advisedly that I regret that I have not heretofore attended these conventions, because I learned yesterday that I was in error in my belief as to what was the real manner of their being conducted, and as to the value of what was to be derived from listening to the able addresses that I listened to yesterday. In my opinion the State Dairymen's association is a high educator, a school, where those who want to gain knowledge can go and learn and to this association belongs the credit of placing Wisconsin in the foremost ranks of the dairy producing states of our beloved republic. Mr. President, I do not think that I am capable of saying anything to an audience of practical butter and cheese makers, but I suppose this association is doing as other educational institutions, teaching the theory as well, as the practice, of your profession.

Now, in relation to the exhibit of dairy products at the world's fair. The state of Wisconsin stands upon the very threshold of Jackson park. She must look to her laurels in the future as a dairy producing state, and she cannot afford to be illy represented at that expositoin. The whole world, not only the states and territories of the republic, but foreign nations are looking with wonderment upon the great and beautiful development of dairy products in our country. It is to-day, I am led to believe, almost in its infancy, but it is growing to a marvelous extent through the instrumentality, I believe, of just such conventions as you are now holding, and therefore, it behoves every dairyman, every producer of butter and cheese in the state of Wisconsin, to look well with an eye single to the future, that the laurels that she to-day so proudly wears as a producer of this class of goods shall not be snatched by some

other state from her brow. Wisconsin ought to be , and I have no doubt will be, in this particular commodity, fully represented, and I am anxious to assist in any way I can, the dairymen of Wisconsin in showing to the world that they are not second, but that they stand upon the topmost pinnacle as producers of good butter and cheese. Gentlemen, for the first time in the annals of the history of nations we are going to have at Chicago, in 1893, a building used exclusively for dairy products. Nothing was ever known or heard of in that direction before at any exposition, neither at London, nor Vienna, at the Centennial, or at New Orleans, but the national commission appreciates the vast development of the dairy interest and the progress that it is making, and are constructing a building exclusively for their use. In that building there will be conducted during the entire fair, commencing on the first day of May, 1893, and closing on the last day of October, a model dairy school, which will be in operation for the purpose of testing the respective merits of the different dairy herds of cattle as butter and milk producers, and statistics will be taken from day to day that will be in the future of incalculable value to the dairyman, not only of Wisconsin, but of the United States. There will be a seating capacity around this school sufficient to seat four or five hundred people, so that our dairymen can sit there and watch the operations of the dairy school as it goes on from time to time. In this building the exhibit of butter and cheese will also be made. Now, I really wish that this exhibit could have been made a collective one, instead of an individual exhibition, because I think the competition would be of greater value to the state. We are indebted somewhat, if not wholly, to the Columbian Dairy association, of which your president is also president, for nearly all that we have gained in this respect.

I have here the classification of the butter and cheese at the Columbian exposition, and I shall be glad to send a copy of this to any member who will send me his name and address. I wish you would all understand that your board of world's fair managers desire to do everything that is in their power to further this grand interest of dairying in Wisconsin, and let me

say to you, gentlemen, that when politics enter into this matter at that time I shall step down and out. I have undertaken a duty which I propose to carry out to the best of my ability, and I am sure there is not one of the ladies and gentlemen on this board who will allow politics to enter into their service at all. Let me say to you also, gentlemen, that when the time comes to appoint people to look after this interest in Chicago, that as far as the dairy interest is concerned, we shall not appoint a man who belongs to some particular party or dogma, but we shall ask the dairymen's association to say who shall take charge of it, and we shall never ask what his political color is, because we desire that the interest of the state be represented, and not political parties. We must work together, with this one idea, gentlemen, we must try, one and all, to advance the interests of our state, and in doing so, people of all political parties, of all religious creeds, must put their shoulders together and work as one man, and then our exhibit will be a success.

PREMIUM LIST OF BUTTER AND CHEESE FOR THE WORLD'S FAIR.

Dairy products will be received for exhibition only between the first and tenth of the following months: June, July, September and October, 1893.

The arrangements of all dairy exhibits will be under the control of the agricultural department.

Exhibits of butter will be classified and limited, as follows:

Class 1. Dairy — Butter made by exhibitor on the farm from a mixed herd. Exhibit to consist of not more than one package, weight to be not less than 10 nor more than 20 pounds.

Class 2. Dairy — Butter made by exhibitor on the farm from a herd of one breed. Exhibit to consist of not more than one package, weight to be not less than 10 nor more than 20 pounds

Class 3. Prints and Fancy Packages — Butter must be manufactured by exhibitor. Exhibit to occupy space not exceeding 18 inches square. Total weight of exhibit not to exceed 20 pounds.

Class 4. Creamery— Butter made by exhibitor from the milk of mixed herds from cream separated from the milk in the creamery where the butter is made. Exhibit to consist of one commercial package, to weigh not less than 55 pounds.

Class 5. Creamery — Butter made by exhibitor from gathered cream. Exhibit to consist of one commercial package, to weigh not less than 55 pounds.

Exhibits of cheese will be classified and limited, as follows:

FACTORY CHEESE.

Class 1. Cheddars — Exhibit to consist of one cheese, diameter not less than 14 nor more than 15 inches, height not less than 9 inches. Weight to be not less than 60 pounds.

Flats—Exhibit to consist of one cheese, diameter not less than 14 nor more than 15 inches. Weight to be not less than 30 nor more than 35 pounds.

Young Americas — Exhibit to consist of four cheese in one package, total weight to be not less than 35 nor more than 40 pounds.

Domestic Swiss — Exhibit to consist of one cheese, weight to be not less than 30 pounds.

Brick Cheese — Exhibit to consist of six bricks in one package, total weight to be not less than 20 nor more than 30 pounds.

Class 2. Dairy—Cheese made by exhibitor on the farm from exhibitor's own herd. Exhibit to consist of one cheese, weight to be not less than 30 pounds.

All cheese exhibited known commercially as "American" and "Canadian" cheese must be manufactured of full new milk.

Cheese that has been cut, bored or tried in any way will not be admitted for exhibition.

All cheese will be divided into two classes, that made previous to the year 1893, and that made during the year 1893, and will be judged on the following points, the figures indicating the maximum per cent., the total of fall such maximums being 100·

Flavor, 45; texture, 20; color, 15; salting, 10; make up, 10. Total, 100.

Butter will be judged on the following points, the figures indicating the maximum per cent., the total of all such maximums being 100.

Flavor, 45; grain, 25; color, 15; salting, 10; packing, 5. Total, 100.

The general standard color for butter will be "June grass butter."

Mr. Morrison moved that the chair appoint a committee to confer with the state commission in reference to a plan of a scope commensurate with Wisconsin's great industries in relation to the exhibit of butter and cheese to be made at the world's fair.

Motion seconded and carried.

THE DIFFERENT VALUES OF MILK AND HOW TO DETERMINE THEM BY THE BABCOCK TEST.

GEN. GEO. W. BURCHARD, FT. ATKINSON.

Mr. President, Ladies and Gentlemen—My part in this program is more mechanical than otherwise. It is not my purpose to enter into any discussion of the first part of this topic. Everybody is too well convinced in his own mind that there is an essential difference in the milk from different cows and from the same cow at different seasons. It is a matter of personal experience that milk, as we get it, differs very essentially in a great many ways. As far as the dairyman is concerned, the fat contents of milk is the only part of it that can be utilized for the manufacture of butter, while practically for the manufacture of cheese, the only elements in milk that are of any avail, are the fat contents and the caseine contents. The question for us to determine is, whether we have or whether we can obtain any simple, direct, expeditious and economical method of determining the fat contents in the milk.

It has been asserted now for something more than twelve months that the Babcock test meets all these conditions and there are a large number of people who believe that this asser

tion is true; on the other hand, there are a good many people who, reluctantly, perhaps, admit that the machine in the hands of an expert will accomplish this, but for some reason or other is not a practical machine to put into the hands of A., B. and C., unless they have had sufficient training in that direction. There are others, probably, not so many in this audience, who, perchance have never heard of the Babcock test, or if they have, have taken no pains to inform themselves as to what may be its merits or its demerits.

I think one reason why I was called upon to talk upon this topic and illustrate this matter is that I don't know very much about the Babcock machine practically. I don't think I ever attempted to make more than half a dozen tests, and I never saw but one test made by other people, and that was by a gentleman who was just learning how, and it will therefore be a reasonable conclusion that if I succeed with this machine here this morning, that anybody else can have equal success I have here what looks like milk. I have no idea where it was produced, or what the character of the milk is or anything about it. I do not know when it was milked from the cow I am more ignorant about it than it is possible for any patron at a creamery or cheese factory to be abount the milk that is delivered to him. Of course, you are equally ignorant, and now we will endeavor to see what there is in this milk and whether this Babcock test can tell us anything about it. (The speaker proceeded to make tests, explaining the process as he went along in detail.)

IS IT PRACTICAL TO APPORTION DIVIDENDS TO PATRONS OF CREAMERIES BY THE BABCOCK TEST.

H. B. GURLER, DE KALB, ILL.

Perhaps the best way for me to commence is to go back and give some of our own experience. I will say first we have been in open rebellion against the old plan of paying for milk ever since we have been in the business, and we have been hoping for some plan by which we could do justice all around.

We introduced first the Short test, then the Iowa station test, or the Patrick test, and the Beimling test, and the Babcock test is what we are using now altogether. We followed this work along carefully a couple of years before we commenced to pay by the test in one creamery, and then the third and the fourth, and now we have five where we are paying on the test plan, but it is only a question of a little time when they will be run in the same way.

Now, we have found that the Babcock test is accurate, and that is one of the first points to establish with the patron. It is a mistake for a creamery man to force this onto his patrons before they understand it. The first thing for the creamery man to do is to get the test going, notify his patrons, invite them in to see its operation and have them bring samples of milk to be tested, and thereby establish confidence in the test. It is perfectly feasible to do, because the test is all right, and when and when you have established this confidence among your patrons the whole field is open; every obstacle is out of the way. We find when we come to establish the test that every patron who is up to the average in intelligence, or a little above, is satisfied. There will be some who are below the average that probably will not be satisfied, but if you have established confidence in the test they have no foundation to stand on to argue against it, and if they are dissatisfied they must keep it to themselves, because it puts them in a position of showing a disposition to get something that don't belong them, and there and very few men who want to get caught that way. As I say, we have had the test in use nearly two years, and the results, the variations, are surprising. After we had run our first creamery nine or ten months, I went over the work to get some some figures, and I found some very interesting points, for instance, one patron had received the largest dividend seven months out of ten. I have with me some figures showing how the thing has worked at our different factories. At our Malta creamery, for the month of October, the patron receiving the highest pay received per hundred pounds of butter 5.95, while the lowest was 3.8. At our De Kalb creamery there was a difference of 29 per cent. between the highest and the lowest.

Mr. Favill — I want to ask, before I forget it, did the churn bear you out in these tests; did you get your butter to correspond with those tests?

Mr. Gurler — The churn makes more than the test shows, always; if it didn't, I would know something was wrong. The test shows the oil; the butter is not all oil.

The Chairman — The test shows the abstract oil; the churn shows oil, water and salt.

Mr. Gurler — This idea that the test and the churn must agree is nonsense.

The Chairman — The churn should show about 15 to 20 per cent. more butter than the test.

Mr. Gurler — If it does not, you are making a loss in your skim milk and butter milk.

Mr. Favill — Did you pay your patrons according to that test and you pocket the rest of the money, or did you give them all that the churn gave out in that proportion?

Mr. Gurler — We pay our patrons for all the butter that is made. You can pay on the oil and be just as accurate as to pay on the butter.

Mr. Favill — Would the patron get all that he ought to have?

Mr. Gurler — Yes, if it is properly handled. If that man wants to be honest, he can. You go through the month's work and your total oil test has brought so much money, or you may add the percentage that the churn makes above the oil, and say your total butter has brought so much money. It don't make any difference which way you figure that, Mr. Favill. At the end of the month's work at the creamery, say we have got $3,000. We have made a certain number of pounds of butter that have brought those $3,000, or we have made a certain number of pounds of oil that have brought those $3,000. It is just as broad as it is long; it don't make any difference to the patron. We adopted the butter plan for the reason that we were right in the Elgin section, where our patrons were watching the butter market and it was more convenient for them to make their calculations that way.

Mr. Favill — I know a factory that is running in this way

They don't report to the patrons how much money they have got; they say so much oil is shown in your milk, and we will pay you for that oil at the price of butter.

The Chairman — Mr. Favill, you know there is any quantity of patrons and farmers in this country who are apologizing all the while that they are living here anyhow. A set of patrons that would allow such a state of affairs and do business on that basis and do not know anything about it, deserves to live in times a good deal farther back than those we live in.

Mr. Favill — They do a heap of growling, but the man that is running it has got them by the gills and they have to stand it.

Mr. Sampson — I don't like to hear such talk. We have tried this test. We run our factory before, and there was lots of growling and grumbling. There were some farmers that were always grumbling; they said they had better milk than some others. Last year we put in a Babcock test and not a word of trouble has followed. Our statement shows what the butter in the factory brings; we take the money and divide it up according to that test, and it is giving the best satisfaction. The farmers have got money enough to build factories themselves, if they don't like the creamery man.

Mr. Favill — I am not finding fault with the Babcock test. It is all right, but it wants to be put into the hands of honest men and careful men.

Mr. Gurler — There is one thing I want to say. It is a thoroughly established fact, beyond question I think, that there is just as much difference in the actual butter value of our milk, and the cheese value, as there is in any other farm product. Now, what would we think of a man that would go on the market and agree to pay a uniform price for hogs or steers or sheep; suppose these big firms at the stock yards should make a uniform price, for the cattle they buy. Why, you know very well it wouldn't be long before they would have to go out of business. Now, why should we do that in the milk business, either, when there is no occasion for it? The greatest good in this business is coming to the individual dairyman. We, as creamery men, apply this test to the dairy.

The dairymen are going to carry it right along down the line. We are all going to do it, to apply those tests to our individual cows, and weed out those that don't make us any money. I think here is the grandest opportunity for a man to help himself that has ever happened in the dairy business since this world was created. I do not think we can overestimate the good thing that is going to come from it.

Mr. Morton — Is not the Babcock test used as an adjuster between patrons, and as an adjuster between the cows in the stable?

Mr. Gurler — That is just right.

Mr. Noyes — The farmers should have a test in every dairy. Before their milk starts away to the creamery at all they have the privilege of testing that milk, and to know what their milk is testing every day.

The Chairman — For $10 he can put a test in his own house.

Mr. Fuller — How long does it take to make the test?

The Chairman — It takes about ten minutes.

Mr. Fuller — It took Gen. Burchard longer than that.

The Chairman — He threw in a lecture along with it.

Mr. Odell — I presume twenty-five times this winter I have timed these tests in our farmers' institutes, and other places, and I have seen it done in from ten to fourteen minutes. Mr. Goodrich has done it many times, and he can use a half hour if he is making his lecture to the institute at the same time. It is merely a question of taking the time to give the public a lot of information.

Mr. DeLand — Do you test the milk every day or once or twice a week?

Mr. Gurler —We save samples every day and use what we call the composite test. In the winter time we do not make them more than once a week. We accumulate samples, let them freeze up, and they work all right. We have done it once in two weeks.

Question — Do you use a compound to preserve the sweetness of the milk?

Mr. Gurler — Not in those composite samples. We use a small amount of Lewis' composite lye to cut the compound.

When we make a test, we have, say, three-quarters of a pound of milk. We take our sample from that after we have put in from half to a spoonful of the Lewis lye to a pound, which must be stirred in with the milk. You don't want to get in enough to color your milk, it just wants to be a rich cream color.

Mr. Boyd —You want to keep it fluid?

Mr. Gurler —Yes, it will reduce the thick, sour milk so that it will pour as well as fresh milk, and then we get the sample.

Mr. Monrad — If the milk arrives at the factory in a frozen condition, can you take a fair sample then?

Mr. Gurler — No, sir, but there the patron suffers himself; it beats the patron. We have been showing that point to our patrons. We say, when we pick up a can cover and see that the milk is frozen, "Your test will be off today, and you can't blame us." They all know after a little experience that that state of things is bound to reduce the test, and it is an inducement to a man to take care of his milk, and that is nothing more than he ought to do.

Mr. Boyd — How much more butter should the churn show than than the test shows butter fat?

Mr. Gurler —That depends upon the thoroughness of the work of the man at the creamery. We find our test runs from 12 as high as 18 per cent. additional. That is, the churn would show that per cent. more butter than there was fat.

Mr. Boyd — How do you account for that great difference?

Mr. Gurler — This 7.3 was the first month that we went to work, and we had not applied the Babcock test to our skimmilk and buttermilk, we had not been looking after the separators and the churn so sharply as we have since. We have helped ourselves up with the Babcock test and have kind of come together.

Mr. Gilbert—You have been testing your butter maker?

Gen. Burchard — May I ask if it is practicable to make an absolutely uniform quality of butter every day, that is in regard to the amount of water contents?

Mr. Gurler —Well, no, it is not practicable, but if you are careful on all the points you can get very near to it. There are

some fine points in regard to the temperature at which your butter comes, and the temperature of the water that you wash butter in. If you take pains to temper your water down to 56 degrees, possibly 58 degrees, we find we get a smaller percentage of water in it than if we wash it at 40 degrees.

Mr. Boyd — Then it is a matter of temperature altogether how much water the butter contains.

Mr. Goodrich — And the amount of work?

Mr. Sawyer — How about your per cent. of increase at different times of the year?

Mr. Gurler —We get more of an increase as a rule in cold weather than we do in warm weather.

Mr. Sawyer — Theu the richer the milk the larger the increase of the churn over the test?

Mr. Gurler —Yes, that is a fact.

Gen. Burchard — If there is two per cent. of fat left in the skim milk that bears a certain relation to the three per cent. milk, and it bears a much smaller proportion to the six per cent. milk, the proportion of loss is much larger in the one case than in the other.

Mr. Gurler — Yes, that is all true.

Mr. Dennison — Mr. Gurler answered a certain question here in regard to this increased amount of butter from the churn by saying that he had been testing himself, and testing his churn, and testing a separator, leaving the inference to be drawn that he had improved by the process, so as to improve the gain from seven up to eighteen per cent. Now, isn't the difference in the water?

Mr. Gurler — Every creamery man knows you can't load water in butter. I haven't analyzed to know how much you can load, but I should expect that we would have to have twenty per cent.

The Chairman — Evidently Mr. Gurler hasn't been trying to load.

Mr. Dennison — How does your skim milk test?

Mr. Gurler — We get it to test so we can't read it at all; we will only find a few drops floating around that will cover perhaps $\frac{1}{8}$ on the neck of a bottle. If we get fat in our skim

milk to cover over the surface of the neck, are not satisfied. We find in the butter milk from .1 to .4.

A. R. Hoard — In taking that composite test, isn't there danger of the water evaporating so that it will make your test higher than it would be otherwise?

Mr. Gurler — No. We commenced the first of April and ran into hot weather, and our increase came through the fall and winter months.

Mr. Goodrich — It wouldn't make a bit of difference in the precentage, if it was all evaporated. You put in water and bring it up into the neck, and it don't make any difference whether it is taken out at one time or half a dozen times; the fat wont evaporate. Of course, that is only true if the samples are taken right into the bottles.

Mr. Bender — I would like to ask Mr. Gurler this question: Taking 100 pounds of pure butter fat, what amount of commercial butter would you put on the market on the average?

Mr. Gurler — I could tell you by looking at our books, but let me tell you, this question of the percentage of the increase can be all avoided by paying for the butter fat. When you get through with your month's work at the creamery you receive so many dollars, and you pay for so much butter fat. We were pioneers in this thing, and we had to do the best way we could. We felt that we must adopt all honorable means to satisfy our patrons and sustain ourselves, and we have done it, and some of these fellows that were jumping onto us, had to put in a test to prevent the business coming to us.

Question — How do you take these composite samples?

Mr. Gurler — Our little test tube that we take the samples with is $1\frac{1}{8}$ inches in diameter and 2 inches in length. The cup of that goes into the jar where the patron's milk is kept, and at the end of two weeks we take out a sample and test it from that accumulation of samples.

Mr. Roberts —Why not take one-third this morning one-third to-morrow and one-third next morning?

Mr. Gurler — I think we are saving labor the way we do it. We do our testing all at one place. We have a lady book keeper that does that work. She does much of it, so that she has

become an expert at it. We go and take samples; we mix the samples at the different creameries thoroughly, then take our samples and put them into a bottle, there to be tested. Then we carry them to the home factory and test them there.

Prof. Roberts — Can you mix milk that is put in the bottle and get a fair sample of it?

Mr. Gurler —Yes, we can do it. Our station has done a lot of work in that line in different directions. You can read it all in their bulletins.

Prof. Smith — We have been doing some of this work at our station this winter, at our dairy school, and we find that by weighing the milk and taking a sample and analyzing it, and taking another sample and holding it, as Mr. Gurler does, we have found at the close of the week that they come out almost to a "T." Our figures corroborate Mr. Gurler's statement exactly. We liquify the milk, of course, in taking the composite test, and, for all practical purposes, I don't know but it is just as good exactly as to analyze the milk every day.

Mr. Gurler — We went into this business and have given it all the thought we had to back it. I suppose we have made some mistakes, but I will say this, as far as that composite test is concerned, I have just dropped thinking about it, becoming fully convinced in my own mind that it was all right. Your chief care must be exercised in getting your sample from the patron's milk.

The convention adjourned to 2 o'clock P. M.

The convention met at 2 o'clock P. M.

HOW TO MAKE BUTTER ON THE FARM.

C. P. GOODRICH, FT. ATKINSON.

If we wish to make buntter on the farm, or for that matter, anywhere else, we are going to make it for somebody else to eat. That being the case we want to make it to suit them. If they demand June-colored butter in the winter time, we want to give it to them. If they demand butter salted high, we

will salt it high. If they demand fresh butter we will make it fresh; if they demand sweet cream butter, we will make it sweet cream butter; we want to suit those who are able and willing to pay a good price for that that does suit them. Now, we can't find this out by our own tastes always. We don't know what those who are best able to pay want, and so we will send it to an expert dealer and let him criticise it. Now, I know a great many will send their butter down to Chicago to a commission man, who is an expert dealer, and if he writes back to them and criticises them, they are indignant; they are mad right off. They say, "I don't believe anything of the kind; the butter is just as good as anybody's, but that is just an excuse of the man for not getting a higher price. It isn't but three days since that I heard a man talk that very way. He was indignant, and he sat right down and was going to write a real combative letter to the commission man.

I coaxed him not to do it. I said, "Pay attention to what he says, try and make it so he will say it is good." I know how easy it is to get into a fighting mood on this thing.

A great many years ago, when I first commenced to ship butter into the market, I didn't get a very good price for it, and the commission man, C. F. Dexter, wrote me a letter something like this: He says, "I have long since learned that it was not safe to tell the average dairyman the truth about his butter, but something tells me that it will do to chance it with you." Then he went on and criticised me pretty sharply, and I felt a little rising indignation when I came to look it over. You see my wife had made the butter, and whatever she did I thought was just about right, and at first I felt as if it was a kind of an insult to my wife to criticise her butter, but after a little more reflection I concluded I had better swallow down all those feelings, and I wrote back to him and thanked him for the information, and said that I would try and make it so as to suit the market if I could and I asked him to tell me when I got it right and when I got it wrong. Well, by following his suggestions I kept improving.

There is one thing that is actually indispensable in making good butter, no matter what kind of a customer you are mak

ing it for. We must have good milk, and to have good milk, we must have good healthy cows. In the summer they must be in a good, clean pasture, with a variety of good, nutritious, sweet grass, and not run in a mud hole or marshy pasture, with obnoxious, bitter weeds and stagnant pools of water that they will drink out of. In the winter they must be kept in a good, clean, well ventilated stable, and have a variety of the best kind of food, good hay, good sweet ensilage, good bright corn fodder and good grain. No cow can give good milk and be fed damaged and rotten ensilage, mouldy hay, musty oats, or corn meal. They must have all the good, pure water they want, and have access to salt. They must be milked with dry, clean hands, in a clean stable and into a clean pail. Now, when we have got the good milk, the next thing is the way to handle it to get the most out of it and the best results. We are bound to get all we can out of it, and we want to make as good a product as we can.

The old way was to set the milk in shallow pans, and I want to say I have a great respect for our grandmothers and the old way of doing it, an I say no better can be made in the world than can be made by setting in shallow pans, but it must be set in a pure, good atmosphere, not where there are bad odors, or you will never get it all out of the cream, nor can you get the cream to rise all of it to the top. I have tested hundreds of samples of milk this winter and I never have found any but what there was some butter fat left in it after the churning. There are other ways of setting and the churning is a very important point, but it takes skillful management to get the cream all out of the milk to start with. The deep, cold setting is a newer way, but no man ever got all the cream out of the milk in that way. The best way to do it is to set it immediately after being drawn from the cow in cold ice water. If it is set in a common shot gun can, they must be covered up tight, if you want good, flavored butter. You will shut in the animal odor or whatever you call it. In skimming the can there is sometimes a good deal of skill required. I tested a can of milk not long ago in which there was over two per cent. of butter fat left in after skimming. The cream had risen pretty well, but there was no skillful skimming

there. The safer way is to have some kind of cans that you draw the milk from the bottom with, then if you leave about an inch of milk with the cream you will not waste much cream. But there is another and more modern way of gettinug the cream out of the milk in handling it on the farm. The farm separators will take it all. The chemist says we can't get it all out, but my eyes are not sharp enough to see anything on top of the bottle. My separator is run with a power as near central as possible. The milk is put into the hoppers of the separator as fast as we milk, and in five minutets after the milking is done we have the cream all separated and take it to the dairy house and the skim milk is all warmed up for the calves at the stables.

Now, there is a difference in the way the cream should be handled, in the different ways that we raise the cream. If it is raised on shallow pans, the cream is partly ripened before it is skimmed, so there is no trouble in ripening the cream and holding it at sixty degrees and churning it when you get ready, as often as once in two days, but with separator cream it is another thing; it is warm and has all these animal odors in it, and you can spoil your butter if you shut it right up in the can and let it stand. I know this because I have tried it, and I don't want to try it again. The cream must be cooled and well aired, and the way we do it, the cream runs into some of these shot gun cans; there will be two cans half or two-thirds full. We take those cans to the cool room and turn from one to the other, hold it up high so it gets a good aerating. In that way we cool it down to about sixty, and it is kept in a room at about sixty degrees. It can then be put into the cream vat and we hold it at that temperature and churn once in two days. We never put in the last two skimmings at that time. It should ripen itself, but if it does not we put in a starter. If we should churn every day we would always save some of the ripened cream from the last churning and put it in as a starter. Now, if you want to churn to-morrow morning, you would want to have that commence to ripen this afternoon, and if it does not you should put in some already ripened cream, or some sour milk, and start it.

Mr. Weeks — Do you keep the cream covered tight while it is being ripened?

Mr. Goodrich — No, sir, we don't. We churn now at about sixty-three degrees, because we have found that the best temperature for churning with our milk; we put in the butter color into the cream enough to make it about a good summer color, June color, and I have found that exhaustive churning depends on several conditions. Since I got the Babcock tester, I have tested my cows and tested the skim milk, and that is what set me to getting a separator. Ignorance had been a blessing before that, but when I came to know how much I was leaving in the skim milk, it began to make me unhappy. The first test I found I had left 2 per cent. in the butter milk. That wouldn't do. I kept varying the conditions, and at last I got so I only leit one-tenth of one per cent. in the butter milk so you see I only leave one-third of an ounce in 100 pounds of milk, but I am going to chase that third of an ounce until I get that out, too. Now, the conditions depend on the temperature, the ripeness, the thickness of the cream and the complete churning. I have spoken of the ripening and the temperature, which I told you was sixty-three degrees. The thickness of tn cream has a good deal to do with it. When I used to have cream raised in shallow settings, the cream would be very thick. Now, such cream as that you can't get the butter all out of. Where it is raised by the deep, cold setting and always sets twelve hours, and you leave the milk with the cream, you have got to thin the cream to get the best results. You can set the cream over again and draw what milk settles at the bottom, or else you will have to thin to make exhaustive churning, but with the separator you can have the cream as thick as you like, and I have found that cream that is from 25 to 30 per cent. butter fat, is of the best consistency, that is, from three to three and a half pounds of cream to make a pound of butter. Then the speed of the churning, I first thought, had considerable to do with it. The very best results that I got were when I churned one and a half hours. I would not advise so long churning as that, but don't churn too quick. Three quarters of an hour is better than quicker churning.

Mr. Gilbert — How full is your churn?

Mr. Goodrich — About half full. At that time I made about thirty revolutions to the minute, but we run it forty to fifty. It is not a large churn. After the butter has come into granules about the size of kernels of wheat, or a little larger, I put in a handful of salt, revolve the churn once or twice, draw off the butter milk, and wash it twice.

The Chairman — As I understand you put in the salt to raise the butter, and make it float, and not draw off the granules of butter in the butter milk.

Mr. Goodrich — Yes, that is it. If you are bothered that way by the drawing off of the granules of the butter in the butter milk, just try that and see how nicely it makes the butter float. My way is to wash the butter twice with water, say a pail full of water twenty or twenty-five pounds of butter; put in the water, revolve the churn once or twice, and draw off the water. Then put in some more, take the butter out onto the butter worker, weigh it and salt it, an ounce to the pound.

The temperature of the water I put in is about fifty. Then the butter is left on the worker, from two to four hours, and then worked again enough to have the salt thoroughly distributed, and then it is packed in just such packages as the customers want, whatever they are.

Mr. Favill — Suppose it is a hot day and you leave that butter lying on the worker two or three hours. What sort of stuff will it be?

Mr. Goodrich —Well, if the weather is hot enough so as to injure the butter, we don't leave it as long.

Mr. Gilbert — How long does it take to ripen your cream at 60 degrees

Mr. Goodrich —About forty-eight hours.

Mr. Gilbert — Do you get as good results as you would if you ripened it at a higher temperature and ripened it in twenty-four hours?

Mr. Goodrich — I think I do, perhaps I don't.

Mr. Gilbert — I find that in the winter in ripening cream at as low a temperature as that, before it is ripened enough for the churn, it is very liable to make bitter butter.

Mr. Goodrich—We never had any bitter butter, but I know that that is what makes it.

Mr. Gilbert — In what condition is your cream when you consider it ripe for churning?

Mr. Goodrich —It is thickened, it has been about sixteen hours after it commences to turn acid, kept at a temperature of about 60 degrees, perhaps a little above. My boys made butter a little differently. They stop the churn a little sooner, and they salt in the churn. They are trying to save work. The reason I don't like to do that is because I don't know whether I am going to get it salted exactly right or not, because they don't know about the amount of water in the churn.

Mr. Favill— Don't you have to guess at it when you put it on the butter worker?

Mr. Goodrich — It is always just about the same after you have pressed it once with the lever.

Question—Wouldn't it be about the same in the churn every time, if you drained it about so much?

Mr. Goodorich — I find that the boys don't get it salted all the time just alike. The commission men once, when they were notified of it, said they wished they would go back to my way. I want to say that it is possible my way of making butter wouldn't suit every set of customers. The truth is that I don't wash it as completely as most folks. Good butter makers in these days state it is best, but the customers someway have got a notion that they want it about so, and we work the butter salted and all to suit the market. We work the butter milk out.

Mr. Cribble —Won't two washings take all the butter milk out?

Mr. Goodrich — The water will not run perfectly clear the last time.

Mr. Tibbett — I notice you use the expression "just about." What do you mean by that?

Mr. Goodrich — I take it that there is no such thing as doing anything perfectly. What I mean is coming as near perfect as we can.

Mr. Morrison —Do you think that you can wash flavor out of butter?

Mr Goodrich — I once tried brine salting; then I had to wash it perfectly when the butter was very fine, and the experts that handle it said that my butter lacked flavor. Now, I don't know but it is possible that there is a fine flavor that the butter milk left in that was washed out.

Mr. Coburn —What do you mean by brine salting?

Mr. Goodrich — Putting in brine as strong as it can be with the butter, and that coats every little granule of butter with salt.

Mr. Tichnore —Were you ever troubled with any streaks in your butter and what is the occasion of it?

Mr. Goodrich — No, not when it is salted my way, but when it is salted in the churn, and taken right from the churn, and packed, I have seen streaks in it because the salt was not evenly distributed.

Mr. Coburn — Isn't it a fact that when you have washed your butter with water cold enough to make the grains solid so they will not pack together, if you put in salt and revolve the churn and leave it a sufficient time to have that salt dissolve in the butter, it will then work and pack and never have streaks.

Mr. Goodrich — I think it is possible. It depends on how evenly distributed you get the salt.

Mr. Coburn — Can't you mix the butter and salt better if you keep those grains hard, so they will roll in the churn like wheat grains?

Mr. Goodrich — I don't know but you can. I only say I can't.

Mr. Weeks — Mr. Goodrich, don't the temperature have a good deal to do with packing without streaks?

Mr. Goodrich — If it is too cold it can't be packed well

Mr. Gurler —You can soak flavor all out of butter, if you let your butter remain in water an hour or two and it don't convince you, then you are harder to convince than I am.

RESULT OF PAYING PATRONS ACCORDING TO THE BUTTER VALUE OF THEIR MILK.

A. R. HOARD, FT. ATKINSON.

(Manager of Hoard's Creameries.)

After having used the Babcock test for several months and become satisfied with its accuracy in the latter part of March last, we sent the following note to each of our patrons.

"By request of many of the patrons of this creamery, April 1st we shall start in operation a test vat. All milk entering this vat will be paid for in proportion to the amount of butter it will make, as decided by the Babcock test. All patrons desiring their milk to go in this vat must give us notice on or before April 1st or wait until the next month. Further information will be cheerfully given at the creamery."

We anticipated a good deal of opposition from many of the patrons and to preserve harmony proposed a separate vat for all those who preferred pooling their milk in the old way. To our surprise on the morning of the 1st not a pound of milk went into the old vat. Many of the patrons thought that their milk would test low. Certain ones, of course, knew that they would have to quit skimming and in many cases that meant sorghum or mustard on the daily bread, but when it came to putting theirs in with all the rest of the poor and dishonest milk, each one had conceit enough to see that it would end in a losing game; they preferred the society of the best.

Many of the patrons thought that the test would be unfair through the taking of the sample. This we overcame by punching a little hole in the conductor spout and setting a pint basin under it, thus securing almost a perfect sample. A few drops from every half pound of milk must necessarily reach the basin. Every patron's milk must pass over the same hole and the patron sees that no favoritism is shown.

During the nine months that we have used the test our yield has been about three-tenths of a pound higher than during the same months of the four years previous. If the test will bring

about so great an improvement in so short a time with he same cows we may reasonably expect a still greater improvement when the patrons have had time to improve their herds. Before, the whole object of the patron was milk; now it is butter. The average price per one hundred pounds of milk received by our patrons from April to December inclusive was 90⅔ cents. Patron No. 1 received $1.17¼. Patron No. 2 received $1.03½. Patron No. 3, 81 cents. Patron No. 4, 75½ cents. A difference between the highest and the lowest of 41¾.

One hundred pounds of No. 1's milk made as much butter as 155 pounds of No. 4's and as much as 129 pounds of the average. In other words, 100 pounds of No. 1's milk brought him 55 per cent. more than No. 4's and 29 per cent. more than the average.. We have heard many creamery men say that they believed it the only fair way to pay for milk, but the extra labor and expense of testing and book-keeping made them slow to adopt it. We found that it made considerable extra work and expense for acid at first, but after having a pipette made holding one-third the regular amount and using the test bottle as a composite jar, at the end of three days we have the required amount for a sample and do not have to test but once in three days or ten times a month. We have about 100 patrons in our home factory and it takes us three hours to test them all, equivalent to one hour each day.

The extra work in the book-keeping is not much. In our case it does not require as much time as we used to spend in trying to get honest milk.

On the whole the increased yield of butter at 4 cents a pound for making will pay all of the extra expense.

We have lost four or five patrons and gained two or three new ones. Some of the lost will come back. Were we to go back to the old way, over half of our patrons would leave us. The majority are well pleased, we think, as it is. Before the templations were all in the wrong way; now the tendencies are in the right way. As some one has said, you may talk about your oil meal, your pea meal, your oats, your corn and your cows, but the Babcock test will beat them all as a butter producer in factory milk. You may talk about your churches

and your ministers, but I tell you that they are not in it, as compared with the Babcock test, when it comes to making Christians honest.

DISCUSSION.

Mr. Monrad — Can Mr. Hoard tell us the average richness of the milk during 1891 in his factory?

Mr. Hoard — Yes, I can tell you for the whole year of 1891. It is 4.47⅔ of butter, nearly 4½ average. In 1889 it was 4.20; in 1890, 4.19. In 1891 we have run since April on the test, and we have made it 4.47. Here is our test for the month of January, last year, 4.20; February, 4.24; March, 4.12; April 1st we put the test in, and we jumped up to 4.4 May, 4.04; June, 4.1; July 4.6, higher than any winter month; August, 4.41; September, 4.51; October, 4.73; November, 4.80; December, 4.68. That is at one factory, and the average is 4.47⅔.

Mr. Goodrich — Can you tell us what the actual expense is of making the acid test, and the figuring on it?

Mr. Hoard —We have about 1,000 tests a month. I can do it all in a day, the figuring, the extra work, do it easy in a day.

Prof. Roberts — How are these averages made up?

Mr. Hoard — My average yield, as I give it, 4.47⅔, is the twelve yields of the twelve months added together and divided by twelve.

Mr. Daniel — Does the churn run ahead of the test?

Mr. Hoard — Oh, yes. It varies; I have had it as low as eight and a fraction up as high as twenty.

Prof. Roberts — Fifteen would be a fair estimate?

Mr. Hoard — It depends altogether upon the circumstances. I have a one-third Pipette, had it made to order, and we tried it first in my factory, and we had a big surplus. I had another factory that didn't have as big a surplus and I was using the large Pipette there, and I concluded that the sample was a little too small. Then the butter maker, at the factory where we had the largest surplus, measured the sample.

Then, again, we do not figure the fractions, if a patron has 18½, it goes at 18, or 360½, it is called 360. The fraction is marked that way at that factory, and that makes a difference in the average figures. I have another butter maker that thinks he is favoring the patrons by giving them the fractions. It doesn't make any difference to the patrons, only the surplus is affected by it. My smallest Pipette is 5.9, and I allow 1 for weighing, but I should have allowed more

Mr. Darrow — Do you make the dividends from the test or the churn?

Mr. Hoard —Well, the average price of butter is got at by the churn, the amount actually sold. Then the amount of the butter, the amount that the butter will share, is divided by the number of pounds of fat and the surplus added to each amount. When we get through to the end of the month, and we find we have ten thousand pounds of butter, we add the amount of the surplus. I have a very easy way of making out the dividends to save lots of figuring by a little chart which I have.

Mr. Sawyer —You add your per cent. of increase to the amount of butter fat the man has?

Mr. Hoard —Yes, sir.

Mr. Sawyer — Wouldn't it be as simple a matter to add to the price of the butter?

Mr. Hoard — We have lots of patrons that don't understand the dividend system, but they do understand this much. The butter fat yield is a good deal less than the butter yield, after the surplus is added to it, and if a man came out with a yield of four per cent., and it really made four and a half of butter with twelve and a half per cent. surplus, he would think he had a pretty low yield. He wouldn't look at the price of butter fat, and to save that question, we started in at the first factory to make it as near like the old way as we could.

Gen. Burchard — I think if one of Mr. Hoard's patrons can see just exactly what sort of a report he makes to the patrons he and every body would understand it better. At a given time in each month he hands to whomever is delivering the milk an envelope, enclosing a check for the past month. On

the face of this envelope he has a statement made of the month, giving the total amount of milk that that patron has delivered during the month. Under that he gives the yield for one hundred in pounds of butter. Then in another place he gives the average price of butter during that month. Having given the total number of pounds, he then gives the price per one hundred pounds. Then below that he gives the average price and then the highest and lowest per cent. given and the average throughout the whole month, so that every patron has a statement for the whole month of what his own milk ranged, and the average there also for the entire creamery, and for the other creameries under his management.

Mr. Sampson — In our factory they pay for the butter fat and pay no attention to the amount of butter.

Question —What do you do with the difference?

Mr. Sampson — Don't do anything with it.

Mr. Hoard — It makes no difference, we merely pay more for the butter fat. The churn is the final thing to settle it by.

Prof. Roberts — I think it is just as well to leave some things unsaid and unexplained, and study them out ourselves. I often think we teach quite as much by the things we leave unsaid, if we only start the idea.

ADDRESS.

PROF. C. D. SMITH.

(Director Minnesota Experiment Station.)

I just want to say that you must not be discouraged if you can't do every thing that Prof. Roberts has suggested, but do the best you can.

One thing we ought to remember, the conditions in New York, where Prof. Roberts lives, are quite different to what they are in our part of the world. I live in Minnesota. Now, the rain fall which occurs between the first day of September and the first day of the following May in Minnesota is very small. The injury that would be done by leakage to manure out doors is

considerably smaller, probably, than it would be in New York. Of course, the great trouble is in the barn yard, but I think the leakage, when put out doors, would be extremely minute. Since the first day of last December we have had only one-eighth of an inch of rain. In New York it rains every day or more frequently, I understand, and of course that makes it necessary that extra care should be taken. The saving of the liquid value, of course, is important. Another thing. We used four times the quantity of the bedding here that they do east. All the same the grand principle which Prof. Roberts enunciates, is one that can not be too strongly emphasized. A man who has been about the United States as much as I have realizes that, so let us base ourselves upon the very broadest system of agriculture and carry it out in our practice.

The convention adjourned for banquet to meet at 9:30 A. M. the next day.

BANQUET AT THE ATHEARN.

In the retreat of the grand stairway that leads from the obby to the parlor floor of the Athearn, Lockwood & Bauer's orchestra was stationed last evening, and from thence issued the stains of music that were wafted out into the hotel lobby above the heads of 200 guests who were assembled there. It was the occasion of the dairymen's banquet, and to partake of the viands that were offered later, and to share in a hospitable welcome to the many guests. A large number of the business men of Oshkosh had joined the merry-making.

It had been announced thta the banquet would begin shortly after 8 o'clock, but it was nearly 9 when President Hoard, of the Dairymen's association, and other notables, many of whom were accompanied by ladies, filed down the stairway and into the banquet hall. There a pretty scene awaited them. Ranged in three rows lengthwise in the room were the tables, and at the north end of the hall a single table was set apart for the toast master and a few others. The tables themselves presented a very pretty appearance and were very neatly ar-

ranged. Above them were the chandeliers suspended from the handsomely carved ceiling of the hall and throwing their brilliant illumination on the scene below.

One hundred and seventy-five people seated themselves in the banquet hall. Of this number fifty were ladies, and their presence added another pleasing feature of the occasion.

The menu served was as follows:

Raw Oysters. Oyster Stew.
Celery. Olives.
Rosat Turkey. Ham. Veal.
Pressed Chicken.
Larded Beef Tongue.
Potatoes, Saratoga.
Lobster Salad. Sbrimp Salad.
Roman Punch.
French Rolls.
Pistache Ice Cream.
Wine Jelly.
Assorted Cake. Fruit.
Edam and American Cheese.
Water Crackers.
Tea. Coffee.

To the right of Dr. W. A. Gordon, the genial toastmaster, sat ex-Governor Hoard, and to Dr. Gordon's left Mayor Dichmann. All three gentlemen presented a happy picture of contenment and good will. Dr. Gordon in his capacity constituted a complete budget of wit and merriment. Every speaker was presented in a few neat remarks and with facetious merit.

In his opening address a prelude to the presentation of the first toast, he alluded to Oshkosh's reputation for "goodness and piety," her hospitality in the entertainment of guests and lastly to the classes of guests she entertained. While he affirmed that guests were always welcome, he carelessly inferred in a humorous way that the city's reputation had perhaps been at stake in receiving some who were not "angels," as an Oshkoshian hoped to be.

The first toast was "Our Guests." Mayor Dichmann res-

ponded in a cordial address of merit. Other toasts were follows: "Our Hosts," response by H. C. Thom; "The Dairy Farmer, the Right Bower of our Agricultural Prosperity," response by C. R. Boardman; "Grit, a Dairyman's Necessity and a Nation's Hope," response by Hon. H. C. Adams; "The three B's, Brain, Bread and Butter," response by O. T. Dennison; "The Consumer, May His Tribe increase," response by H. I. Weed; "The Yesterday and To-Day of Wisconsin Dairying," response by W. D. Hoard; "The Farmer Boys and Girls, the Pride of the Aresent and the Hope of the Future," response by Prof. I. C. Roberts; "The Jersey Cow, a Savings Bank," response by G. W. Burchard; "The Milk Maid, She Never Fails to Respond to the Call 'To Arm's;" response by Prof. L. D. Harvey; "The Dairymen in Their Fun with the Boys at Oshkosh," response by A. E. Thompson.

Owing to the escape of Prof. W. A. Henry no response was made to the toast "The Farmer Boys of Wisconsin; Give Them a Chance for Their Heads As Well As Their Hands."

The convention met at 9:30 A. M. April 12. The president in the chair.

The committee on nominations made the following report:

REPORT OF COMMITTEE ON NOMINATIONS.

Your committee on nominations respectfully beg leave to report.

It was the unanimous vote to present to this convention the following nominations:

For President —W. D. Hoard.

For Secretary — D. W. Curtis.

For Treasurer — H. K. Loomis.

W. H. MORRISON, Ch'n.
B. E. SAMPSON.
G. W. WASHBURN.
C. E. THORPE,
CHESTER HAZEN.

On motion of Mr. Favill the report of the committee was accepted and adopted unanimously.

President Hoard — On my part, gentlemen, I beg leave to tender to you my sincere thanks, not for the office, not for the work or the care, or the solicitude that it imposes, but for the confidence and regard which you have by this vote extended to me. That is always precious, aye more than precious ointment to me; to if possible retain the confidence of my co-workers in this field, has been an ambition with me more than money, and my wife says often more than herself. Again I thank you.

THE MANAGEMENT OF CHEESE FACTORIES.

O. J. ANGUS, OSHKOSH, WIS.

Sometime previous to the year 2000 all our American institutions and industries will, according to Bellamy, be running under a perfect system. The time required to get our cheese factory business into proper working order will not fall short of the second coming of Bellamy's man Julian West, unless the same means — co-operation — is adopted that was instrumental in bringing about the condition that West will find when he wakes up after his 113 years' nap. Cheese makers must work together, learn that their interests are mutual, not antagonistic, form a society, call a meeting, appoint a chairman who will enforce order, for everyone will have important matters to bring up, resolutions to offer and suggestions to make.

We will notice a very few of the very many important matters that will come up for discussion and adjustment at your first meeting. The question will be raised why so many first-class cheese makers drop out and engage in other business. No. 1 will answer that it comes of the present practice of hiring for makers any who apply if they agree to pay for what cheese they spoil in making. Thus putting reputation, experience and actual knowledge of the master hand on a level with

the unqualified novice who dares to take the risk of losing a sason's wags in a single week.

Abandon the custom of guaranteeing your work. Let the past achievements of the maker be the consideration in selecting your man. Patrons cannot afford to have poor cheese made, even though the cheese maker agrees to act as purchaser of all such at full market price. The loss to the industry at large occasioned by the inferior article of the poor maker cannot be computed, for such cheese possesses staying quailties in proportion that it is unwholesome, and forces the conclusion upon its victims that it is best not to indulge very often in the luxury of cheese, and reminds them frequently during the process of digestion of the correctness of this conclusion.

The speaker says that he can foresee in his plan if adopted a rapid tendency toward the "survival of the fittest" and " no injustice to others" and a continuation in the business of those who possess an adaptability for it. There is more in natural adaptation and a liking for the calling than we are apt to suppose. All of you can recall instances, no doubt, where cheese makers have been remarkably successful with but little instruction. I have in mind now of a party who, after working a short time with a maker who invariably made poor cheese, went into a factory by himself and made first-class cheese the first day and duplicated that day's work the season through. You can hardly call this case one of those happy accidents that are sent to reward the just and encourage ther ighteous. The same kind of accidents are not apt to occur each day for six months. Some one had told him that it was necessary that the farmers bring their milk in proper condition, (a fact that his instructor did not heed), and that constant and eternal vigilance is the price of good cheese. These and a few other pointers, together with his adaptation and good judgment, were the cause of the pupil excelling the teacher.

The next one who gets the floor knows a number of persons who could and did make cheese fit for any market every time, who are out of the business. They liked the work of making cheese, but did not like and could not stand what is called "the business part of it." They could not get used to the ways of

the sharp dealers, were not cut out for detectives, were failures as plaintiffs in lawsuits, etc., etc. In all other braches of business there are men for each department. For instance, the rail road company's car inspector condemns cars unfit for use, but is not expected to commence suit against the ones through whose carelessness the cars become crippled. His business is to continue to conndemn when occasion requires. So ought it to be with the cheese makers. There is too much hash about his work. To be sure, we have a dairy commissioner with a few assistants, but we in this section know little or nothing about them, only by hearsay. There ought to be more of them, and each should have no more territory than he can look after properly. The cheese industry is suffering for assistance, and where the industry is the most infantile it suffers the most and gets the least help.

Some one says, perhaps it would be well to mention to the state a land grant for the aid of the industry. The mention of a railroad suggested this idea. The patronage of each factory suggested this idea. The patronage of each factory ought to be understood to belong permanently to that factory and any disagreement or dissatisfaction should not be a signal for a stampede to some other place, or the springing up of another factory beside the old one. The present uncertainty of milk continuing to be furnished where it is being taken is the main cause for there being no better factory buildings than we have. New factories should be put in operation only where the visible supply of milk that will be furnished will warrant the right kind of farm building, good tools, and first-class makers, and four miles at least distant from the next.

At this point it may be time to adjourn for a week. At your next meeting you will discuss whether boards of trade for the sale of dairy products are an advantage to the dairy business. If you conclude they are, someone will offer resolutions condemning the practice of buyers agreeing to pay more than they can afford for cheese at the dairy meeting, and kicking on quality upon inspection, when all that is against the cheese is that they agreed to pay more than the market will stand.

You will settle the matter of the Babcock test furnishing the

correct basis upon which to apportion dividends to cheese factory patrons. Much free education will be obtained at your meetings from those who have attended the dairy course at Madison, and so long as there is work for cheese makers in factories there will be important business to transact at their society gatherings.

The patron, too, would do well to hold periodical gatherings, for they have many real grievances and a few imaginary ones. The former can be nowhere as well righted and the later as easily dispelled as at meetings designed for the purpose.

DISCUSSION.

The Chairman — There are scores of cheese makers in Wisconsin who are very ignorant men, so ignorant that they never have read a paper or book containing the experience of any one else on this question, whose minds are guiltless of any hunger or thirst for knowledge as a cast iron surfarce is of absorbing water. I have in mind two men who were running a cheese factory in Wisconsin, are running it today, and they have not the slightest idea what the Babcock test is. They are fair cheese makers to a certain extent, but without that intellectual ability to understand what to do in a variety of instances when intelligence would lead a man out. Now, what are you going to do with such cheese makers? Our cheese making interest in Wisconsin amounts to about 40,000,000 pounds, all made in factories.

A Member — They want instructors, don't they?

The Chairman —Well, the instructors can't furnish the brains to either the patrons or to the cheese makers. I tell you, my friends, that it is a tremendously serious bar to the money that ought to come into Wisconsin, and if there are any patrons of cheese factories here, I want them to go home and commence at once to institute a demand for a supply of better brains and better skill. It all depends on the patron, after all. You can't find a cheese maker in the country today where they have got an intelligent lot of patrons who does not some way get a supply of good intelligence. Demand always precedes supply. It is the same exactly with the country school dis-

trict. You let that be peopled with a set of bright farmers, men who have an appreciation of good schools and what is need by their children in the future, and you will always find a good teacher there, but when you find a poor, miserable, no-account teacher you will also find men creeping around that school house whose heads are filled with mud instead of brains, not only farmers, but you find them every where. Now when the demand is for brains brains will come. You want to do something to start the cheese factory patrons, and that was why in my address I suggested that this society appoint a committee to issue suggestions to patrons concerning their best interest and what to do, and to have those suggestions printed in English and German and furnished to the factories all over the state.

I have have been written to within the last month or two a good deal with regard to the Babcock test for cheese factories. Prof. Robertson, the other day in Canada, the man whom I think leads the world in cheese making, tells me that he thinks the time is coming very soon when the test for fat will be taken as the test by which every patron brings his milk to the cheese factory, and it will be divided on that basis just the same as it is in the creamery. Now, I have been asked whether there is a single factory in the state that is practicing that. This is a practical question; somebody has got to be pioneer in the matter, and we should be looking into it. I myself have ransacked the whole country for information. My friends, the country will put the Babcock test into the cheese factory, and it will stop all bickering and all fighting on this subject, and there will be no more of men being called thieves and deceivers and wrangling, such as there has been. Now, then, the wisest and sharpest cheese men in the country will have to make the first move, and every community of patrons that knows enough to know their own interest will come out and work out that problem for themselves and they must not wait for some other factory. We must be independent of judgment. It is just as it is in politics, we don't want to be led by any set of men, but we want to know the truth, for it is only the truth that will make us free of the error which binds us.

CHEESE MAKING THE YEAR ROUND.

H. J. NOYES, RICHLAND CENTER, WIS.

The subject which I have chosen has been discussed so much, it does not seem as though there was the least chance to enlarge upon it.

But we can go over it again and perhaps some points may be brought out in discussion which may help us, or at least some of us. In cheese making, the year 'round, we must in the first place have a factory constructed and equipped, so that the temperature may be regulated as we desire it every day in the year.

In the second place, a first-class cheese maker.

Then we want first-class, pure, well aired, four per cent. milk, with all the cream belonging to it.

For spring cheese making the milk should be thoroughly strained, heated to 88 degrees and ripened to the desired maturity, which is ascertained by the rennet test.

Many cheese makers seem to have a vague and imperfect understanding of the reason for procuring ripeness in the milk, before the addition of rennet, and do not seem to appreciate the fact, or rather do not seem to know that this ripeness is not merely to facilitate the action of rennet, but is something which goes farther; influencing the balance of the process, and entering into the composition of the cheese itself.

It is therefore highly important that the greatest amount of light be thrown upon this mystery of the business, and that makers exert themselves in the study of its manifestations and effects.

Of one thing we are certain and that is by getting the milk into a certain condition before adding the rennet, much time is saved in the subsequent part of the work, because all we fail to do this time must be done afterward.

It is a known fact that milk ripens best when its elements are all together and intact.

In the spring when cheese is required to be cured quickly,

from eight to fourteen days, I would use rennet enough to induce coagulation in from six to ten minutes.

The time for cutting the curd is twice and one half the time consumed in coagulation, or when the fore finger is inserted it will break clear over it.

In cutting great care should be taken not to bruise the curd, I cut lengthwise, first with horizontal knife, then with perpendicular, until the required firmness is obtained. I would then remove the curd from the sides and the bottom of the vat with my hands and stir five minutes before applying the heat.

Then I would raise the temperature very slowly, being in from thirty to fifty minutes in heating, constantly stirring to prevent it from baking on the hot surface of the vat, and keeping it uniform and free from lumps, gradually increasing the heat as the curd separates from the whey and becomes firmer. 100 degrees is the usual temperature in the spring of the year.

To determine the question of cooking is one of the first points in cheese making, and cannot be explained in words, but must be learned by experience.

Not more than two and one-half hours should elapse from the time the milk is ripe till the curd should be spread on the rack. This can be done by properly ripening the milk.

The whey should be drawn as soon as there is any sign of acids. The curd should be spread on the racks, stirred until well drained, allowed to mat, then cut into uniform pieces, turned as often as required to thoroughly drain, keeping the temperature to 98 degrees. In doing this we solidify the curd and force out the gases which may be lurking there.

When the curd has the required flexibility and at the same time silky texture and that buttery quality) which an experienced maker will readily understand), the curd is ready to grind if there is sufficient acid.

After grinding the curd should be well aired, stirred and salted one and one-half pounds to one thousand pounds of milk, in the spring of the year.

Curd should always stand after salting until the sharp feeling leaves it and it is cooled down to 75 or 80 degrees.

Then put to press, causing the pressure to be applied very slowly at first, to prevent the fat from being pressed out. In one or two hours the cheese should be taken from the hood, dressed carefully, returned and pressed from 24 to 48 hours, the latter being preferable. But when this is done the cheese should be taken out in 24 hours and reversed, seeing that the bandage is perfectly smooth, then apply all the pressure you have. The curing-room should be kept from 60 to 65 degrees the year round.

SUMMER CHEESE MAKING.

The general rules for summer cheese making should be the same as those for spring with the following exceptions, less rennet; enough being used to coagulate in from 15 to 20 minated according to the quality of the milk.

When the milk is good the curd should be cooked to 98 degrees.

When poor and the curd is soft and slippery the heat should be raised until the required firmness and cook is obtained.

The proper ripening will assist in the working of poor, tainted milk more than any one thing; in this kind of milk the starter should always be used; such milk should be more fully ripened than good milk, when this is properly done you never will have a whey soaked slippery curd.

Draw the whey, throw the curd on racks, and pile and repile again and again, which will throughly drain, and at the same time eliminate the gases, continue this until sufficient acid. The proper flexibility and silky, meaty texture (spoken of in SPRING cheese making) is obtained, when it is ready to grind. From two to two and one half lbs. of salt should be used according to the curd.

In the fall and winter I would use about the same amount of rennet, cooking high enough to prevent the cheese from being pasty, salting the same as in summer. There are a few rules in cheese making which should be followed.

First: good pure milk, Second: ripening the milk properly, Third: good cook, Fourth: keeping the curd at the proper temperture, Fifth: a meaty, flexible, buttery quality, which is re-

quired in good cheese. Sixth: Good pressing, Seventh: Cleanliness, both in factory, operator and patron. One of the worst filths that we get in milk is from filthy, unaired barns and dirty milkers.

If farmers would study their own interest more carefully, I think they would find without any great expenditure of brain power, that the manure which they take to the factory in their milk would be more valuable spread upon their pastures.

But then the greater per cent. of such mllk is bought by men who do not believe in Farmers' Institutes, Dairymen's Associations, Hoard's Dairyman, etc, therefore those who need this advice are not here to receive it,

In conclusion I may add that that we owe much to the above named paper and organization, aiso to the dairy and food commissioners, and to the competent cheese instructors who are sent out by our state.

And now another educator is rapidly perfecting itself in order that Wisconsin may lead the nation as a dairy state.

I refer to the new Dairy School at the experiment station, which is now in session at Madison with one hundred and two students enrolled. All are eager to learn, and in addition to butter and cheese making, they are taught testing and analizing of milk, butter and cheese.

The faculty are making great efforts in their behalf.

This building, when completed, will be the finest in the world.

DISCUSSION.

Mr. Monrad — I would like to ask Mr. Noyes if it would not be a great improvement upon our common gang press if the manufacturers would arrange it so as to have a continuous pressure.

Mr. Noyes — Well, I think it would, and our gang presses are so constructed nowadays. That is they have a spring at one end of the gang press so that it keeps the pressue on all the time.

Mr. Monrad. I don't think that is having the effect that is expected, that is, supposing that the spring, when there is no pressure, is six inches wide or long, then when we screw it up so as to bring it down to three inches, the moment that pressure is relieved then the pressure on the cheese is relieved. I mean to say the minute we press it up, we have a half ton of pressure, when that spring goes back then we have one or two hundred pounds less pressure. I think Mr. Noyes would agree with me that a press that would work right would be like clockwork and start in and steadily increase in the pressure. The lever system has been used across the water and applied to all gang presses.

The Chairman — When you get the cheese in the press first you should be careful about the first pressue, but is it your theory that it should be strongest at the very last moment of pressing.

Mr. Monrad — No, not the very last minute. I think the first six hours it should keep on increasing, and that can be done by applying the lever system to the pressblock. I think there is the weak point in cheese pressing is this, that the cheese maker is always in too much of a hurry to go to press, and when he has got to press he will go about some other business.

Prof. Roberts — The gentleman's point is well taken. I have wondered that with all our inventions why we couldn't have a cheese press with a continuous pressure. There is always steam power in a factory and there is no trouble in pumping water or weights up, and then we have a good pressure.

Mr. Dean — While I was east in Ontario this summer I visited the factory of Mr. Strong. He has the ideal press you speak of. He pumps water up and then he has a large wheel six or eight feet in diameter. This water drops right onto th is big wheel, and when his manager quits at night he just turns the water on and there is pressure going on all night. It is not a theory, but an actual fact.

Mr. DeLand — I imagine that column of water that is on the wheel simply makes the head block follow up, and I don't believe it keeps up the pressure; it has to be pretty heavy. What is needed is something that will keep about the same press-

ure during the whole process. The fact is that when the pressure is applied, say a second time, we often apply a greater pressure, but there is no more pressue on those particles until he returns and turns up the trace again.

Mr. Monrad — I make it my business to try and glean over all the inventions that I see. The gang press is a great improvement, but when it was imported to Denmark they set to work and applied this lever system, and it was shown at the exposition three years ago. When Dr. Babcock's test was first invented, I am proud to say that I bought the first test made in Chicago and shipped it to Denmark, so you see I am trying to give Denmark what I find of use and I try to disseminate a knowledge of the inventions I find here.

Mr. Morrison — I would like to ask Mr. Noyes something in regard to his process of ripening milk, what he uses for a starter.

Mr. Noyes — The way I usually ripen milk, the milk is set I heat it up and let it stand, and agitate it so it will ripen.

The Chairman — How do you determine ripeness?

Mr. Noyes — By the rennet test, you can take a dram of rennet and twenty ounces of milk, or any portion of that. You can't ripen cream in all factories just the same; you won't get the same results. A man has got to ripen his cream according to the way it works. I don't like an imported starter. I prefer to hold my milk until it is ripened properly if I hold it until one o'clock in the day, but you must hold it until it is properly ripened if you are going to have good results. Lots of cheese makers will take in milk in cool weather, where the patrons have submerged their milk very quickly after milking in very cold water. In that case the animal odors are frozen right into the milk, and no cheese maker can detect it until it is heated up. The cooking and the ripening of the milk is the great thing in cheese making, and a maker who understands those processes has got nine tenths of the business.

Question — Which do you consider the best test to determine the cheese value of milk?

Mr. Noyes — I think the Babcock is the proper thing either in the creamery or the cheese factory.

The Chairman — Are there any other cheese factories in our State that take in milk and decide the value by the Babcock test? How many? Let us get it down in writing so that fifty years from now we can see who these men are.

(The following factories responded: The Crystal Spring Factory, near Berlin; the Page Factory, near Berlin; the factory at Cedar Grove.)

The Chairman — Can Mr. DeLand state what the experience has been with the Cedar Grove Factory?

Mr. Deland — I gather that the majority of the patrons are well pleased with it. The manager of the factors told me at first that he thought a certain number would probably go to another factory, but the last talk I had with him, he thought he would not loose them.

Prof. Henry — What is the name of that manager?

Mr. DeLand — Henry Walden.

Prof. Henry — He is one of our students. What is the name of the man that runs the Page Factory, south of Berlin?

A Member — John High.

Prof. Henry — Another one of our students. I understand the Crystal Spring and the Page factories are the same.

Mr. Noyes — There are two others that I have heard of, but I cannot name them.

The Chairman — I wish you would find out about them and let us know.

Mr. Noyes — I will say that I have determined to put in the Babcock test in the spring.

Mr. Aderholt — So have I.

Prof. Henry — Another dairy student.

Mr. Whittemore —What element of the patronage of the factory is expected to leave the factory, the skim milk, or the butter milk?

Mr. Deland — It will not be the butter element. I have made my last cheese in the factory on the old plan. No cheese will ever be made in a factory that I have any interest in, except the milk be testetd and the dividend paid out accordingly. Every cheese maker in this state has got to come to it. I believe, and he might as well take hold this year as to beat the

wall. There will be no trouble if they have grit to stand for the test, and state that to your patrons at your first meeting this sping.

Mr. Breed — I am with Mr. Deland, for one I propose to put in a Babcock test, and I know some other factory men in Calumet county that calculate to do the same thing this spring. I am glad that I came here for this reason, that I have learned more in the last two days than I have in all my life before in regard to dairy matters. There are in my county between thirty and forty cheese factories and butter creameries, and we are running those cheese factories at a loss.

Prof. Short — During last year I have seen many cases in the western part of the state where the average of the milk in the factory was a little above two per cent. was found to be so by the Babcock test, and after the test had been in the factory a few days, the maker told me he did not have a single bit of milk that ran below four pounds to the hundred.

The Chairman — My own personal experience in creamery work at Ft. Atkinson may give you some intelligence. This question is surrounded by another difficulty, that of competing with other factories, and you know men are selfish, they will take all kinds of advantage. This same principle applies to the cheese factory. When we put in our test last spring, we had some competing creameries about and they began to smirk, and said, "We will make the Hoard creameries hunt their holes." I expostulated with one of them. I said, "You are purblind, and instead of demoralizing our patrons, before we have run six months, you will be demoralized yourselves." Now, my friends, what is the result? In October the Hoard creameries paid $1.28, and the highest dividends paid by any other creamery was $1.17, eleven cents difference on every hundred pounds of milk, and it has created a tremendous disturbance. The reason of this is that the Hoard creameries gave credit for all the fat in the milk, and the others gave credit for what they could get out of it. Don't you see that the test has raised up the average in our creameries, and has reduced what insurance men call moral hazard.

Prof. Henry — If you should save a half a pound of fat on 100

pounds of milk, you are making a good deal more cheese than a half pound more to the hundred. We are at work on that problem now at the station. Our dairy students were put into the experiment class on the fifth week and told to begin experiments and they are started out with one per cent. milk, and told to see how many pounds of cheese they can make with that; then they are given two per cent. milk, then three and four, and so on up, but from what we already know the difference of half a pound of fat on the hundred makes more than a half a pound of difference in the cheese.

Now, I wish to say that there has been a rumor going about to the effect that the Babcock test is a patent from which Dr. Babcock is getting rich. Dr. Babcock did not patent his invention and it is free to the people of the country. Had he patented it, he would have had royalties amounting to over $10,000 a year from that patent, but his salary is paid by the people of this state, or rather by the general government, and Dr. Babcock is perfectly content to take his salary and give this great invention to the people. Now, when the editor of a paper insinuates that Dr. Babcock is getting rich, and that all the papers which are writing about it are simply doing his advertising, that editor knows better, and I hope that nobody will believe any such thing. This machine is sold at a price in which there is no profit compared with other things.

Mr. Dennison — I have a resolution on this point. "Resolved that our thanks are due and hereby tendered to Dr. S. M. Babcock for his unselfish and untiring labors in advancing dairy knowledge and especially for generously giving to the entire dairy world, without reserve and without reward, his milk test, by which he has conferred a benefit beyond comparison." I move the adoption of that resolution.

Motion seconded and put to the house.

Mr. Dennison — I wish simply to explain my motive. I am from Iowa. There are hundreds and hundreds of Babcock tests in Iowa now, and more going every day into universal use. There is no jealousy between the Iowa test, Mr. Patrick's; there is no jealousy between Dr. Babcock and Mr. Patrick, of Iowa. Now, I have seen quoted from the Jersey

"Bulletin" an editorial insinuating in rather an uneditorial manner that Dr. Babcock is receiving royalty on this patent. and he is represented as sitting in an easy chair counting his dollars and laughing at the silly editors in this country who are giving him free advertising. Now, Dr. Babcock is a most unselfish man, you all know, in the world, and I wish to resent that insult from Iowa.

Mr. Monrad — When I first read that editorial in question my blood burned. Then the next impulse was this, that we should take no more notice of such a scurrilous attack on a man like Dr. Babcock than we would of a cur barking on the road. Now, I should stick to that idea, if it was not of one reason. I have noticed that in your political strifes in his country both candidates are represented by the other side as the very worst men in your country. I have noticed also that men going about who do not understand these tactics, get the impression that your foremost men are all thieves, robbers, and goodness knows what. For this reason, Mr. President, I thought it was best that this association take action on this matter. For a great many years, ever since I made the acquaintance of that little breed of cattle, the Jerseys, those beautiful little cows, it has been my ambition some day before I die, to own a little herd. Now, I tell you, Mr. President, I thank my stars that I am not the owner of a Jersey cow to-day, seeing that the so-called champion and representative of the Jersey cow is a man like the man who wrote that article. It matters very little, Mr. President whether we pass that resolution or not. Dr. Babcock's name is and will forever be inscribed in golden letters in the history of dairying all over the world. There is not a man that I have met that has known the doctor but what he has admired him and loved him, and no man has ever gone to him and asked his advice but what he has sat down patiently and listened to the veriest nonsense and then given good honest advice. It has been my privilege to meet the leading spirits in the dairy world, not only in America, but all over the world, and I say without exception I have never met the equal of Dr. Babcock.

The resolution was put to the house and carried unanimously by a rising vote.

The following questions have been handed in to the secretary, were read and elicited the answers as shown:

Question — Is there not a compensation in putting manure on pasture land in early summer in the rest the land gets by the cattle refusing to feed thereon?

Answer, by Prof. Roberts—Yes, very great.

There is nothing that can be done to make the pasture better in weak spots than to spread the manure or anything else that will give it a rest for the time being. That is the way we bring up our poor hills.

Question — Does the gentleman from New York manure his farm from the stock kept on the farm and feed from the product of the farm?

Prof. Roberts — The first, yes. The second, we buy some grain and a little hay, because we can't keep thirty horses and forty cattle and fifty sheep, and a lot of swine on 120 acres of land without adding something.

Question — Mr. Boyd, When is the best time to put manure on the pasture land?

Prof. Roberts — Oh, in the fall, on the surface, where there is a plant root.

Question — What is the proper way to figure on the value of caseine in cheese making?

Mr. Noyes — I can't say exactly, but I don't think there is enough of it to make it pay to figure on the caseine in cheese making. In skim milk there is about nine per cent. solids, and one-third of that caseine. It is so small it don't cut much of a figure.

The Chairman — We figure the commercial value of the caseine as only about two cents. If you get poor skim cheese with all the fat taken out you get about two cents a pound for the caseine.

Question — Does whey contain caseine, and if so, how much ?

Mr. Noyes — It is a very small quantity.

Question — In making part skims, will milk work up into cheese equally as well where a portion of it went through the separator, as well as it would if the skimming was done by the gravity process?

Mr. Noyes — Just the same, if it is skimmed the same.

The Chairman — In the summer time we can sterilize skim milk by heating it to 160 degrees, so as to keep it sweet two days. Now, if we can kill the germs by heating it to 160 degrees, and then go on and make a cheese from it, and the rennet would work equally well, it would be a valuable fact to know, because it wouldn't take but a moment or two to sterilize it. I want to see some experimentns tried on that line. Prof. Roberts says it would work very well if you used a separator, but that the heating of it would very likely take out the ripenenss.

A Member — It takes out the butter fat.

The Chairman—It don't take it out to heat it to 160 degrees, as it would to heat it to 110 or 120 degrees.

Question — Will Prof. Noyes please state to us how butter fat may be worked into cheese?

Mr. Noyes — I don't know of any way except to have them take the milk and handle it properly all through. I believe that five per cent. of milk can be worked into cheese and not make any more loss than three per cent. milk. Of course, it wants to be properly handled by a good cheese maker.

The Chairman — Will you always get the commercial return for the extra one per cent. above four?

Mr. Noyes — Not always, but I believe the time is coming when we will get it all. The state has done a great deal of good in our county by sending instructors, they have raised the standard of our cheese a great deal in the last two years so that last summer on our Board of Trade at Lone Rock, "we had no rejections at all where the cheesemakers followed the instructors' course. If the farmers will take right hold and fall in line with Dr. Babcock's test and raise the standard of their milk up to three and one-half, four and five per cent., we will then have a cheese that will sell every time.

The Chairman: How will they go to work to raise the value of three per cent. milk in the summer time up to three and one-half, four and five?

Mr. Noyes: I don't know as you could get it to that in the summer time, but it could be raised.

The Chairman: I think you could do it. In our own creamery our milk has not run below 3.25 since we put in the Babcock test.

Mr. Noyes: The farmers in our county are willing to pay taxes so as to have those instructors, and get that. A number of our farmers this next year will not only have the Babcock test in their factories, but on the farm, and we cheese makers will try our best to keep up our end.

Prof. Roberts: There are two or three other things that they will want in connection with the Babcock test. First, you want a man, then you want a meal bin, then a pair of scales and then a Babcock test, and then a shotgun.

Mr. Favill: And then send out the fool-killer about once a month.

The Chairman: Stephen, you are not ready to die yet.

Question: Why do you cool the curd down to 75 degrees or 80 degrees before hooping it?

Mr. Noyes: I think that at the temperature the butter fat will press out better than at a higher temperature.

Question: Will the cheese hold up as well?

Mr. Noyes: Yes; there is no trouble.

Prof. Roberts: I would like to ask the Professor if we should not lend our influence toward buying and selling cheese by the amount of butter-fats they contain, the same as we propose now to buy and sell milk?

Mr. Noyes: Yes; I think that is going to be the way that they will be tested.

Mr. Hederholtz: I think it would be a good plan if the members of Boards of Trades would try and induce cheese buyers to discriminate in the price more according to quality. There is too much kicking by buyers on that matter, and it is pretty hard to keep up.

The Chairman: We used to have a better whip-row in the State than we have now. If buyers did not look right sharp, our cheese were put onto an ice car and sent to New York, and we were not under the thumbs of the men who rule prices on the Board of Trade. From 1872 to 1879 we were shipping cheese by the thousand car-loads to the East, whenever

men did not buy according to value, but lately this has almost died out.

Prof. Henry: The result of the present way of doing it is, that the buyer pays an average price and the best cheese goes with the poor cheese.

Mr. Favill: I think that most all cheese-makers will agree with me that a cheese may be perfectly manufactured and then almost totally ruined by bad curing. We ought to have better curing-rooms, and we shall have better cheese.

Mr. De Land: I have been a cheese-maker twenty-five years and I have been a cheese-buyer also, and I do not think that the buyers who have operated in this State the past year are chargeable with anything except that they have many times foolishly paid out money for goods that were not worth what they paid for them. There is a strong demand for full cream cheese, made in the State of Wisconsin. The price was much higher than any other place. I believe buyers were ready to pay what it was worth. The fact is, we are paying too much money for the goods, we are paying more than the goods in New York are worth. We are paying as much considering the item of freight as Canada is obtaining for her goods. There are pure goods that go for less than they are worth, but, an average cheese in the State of Wisconsin has brought a better cheese price than that of other parts. We certainly ought to improve the grade of cheese. The cheese that was made fifteen or sixteen years ago wouldn't have brought this year over six or seven cents a pound when the market price is ten for the goods that we are buying.

The Chairman: Still the argument remains that the buyer don't make better discrimination between good and poor.

Mr. De Land: If we pay the man more than he can get in New York, who is hurt except the buyer?

Mr. Monrad: If the buyer pays too much for poor cheese and makes money in the business, isn't the cheese discriminated against?

Mr. De Land: Not necessarily. I think the consumer pays as much as he ought to pay for the goods.

Mr. Hederholtz: They do not discriminate enough between fair and fancy cheese. If they aren't going to pay more for fancy than for fair, what is the good of making fancy cheese?

The Chairman: I want to suggest to Mr. De Land that some of that cheese made in 1884 was examined by the New York State commissioners, and was marked "Full Cream" and it averaged only twenty-seven per cent. fat, and our standards have to average thirty per cent. fat.

Prof. Henry: You can get a balance for ten dollars, and with a slight modification of the Babcock test you can analyze the cheese just the same as you can milk, and can settle the question on your Boards of Trade. I believe we are coming to that.

Mr. Hazen: If the amount of butter fat in the cheese decided the market value of the cheese, it would be very easy to get at it.

The Chairman: All things else can be determined by the judgment of the buyer.

Mr. Morrison: In reference to the value of cheese, I think that the price will equalize itself just about the same as butter. I notice, in passing around the State, that I am running across men all the time who are making inquries in reference to where they can get some good cheese. I think as soon as we are willing to pay the right price for the value of cheese, it will equalize itself.

The Chairman: The question is: how shall we reform the market, and the judgment of the man who buys?

Prof. Short:: I received a sample of cheese from Mr. Noyes. It had been sent to a St. Paul buyer, and he stated that it was skimmed. They sent a sample to me, and had a sample analyzed in St. Paul, and the analysis showed over thirty-three per cent. of fat. As I understand the proposition here, it is this: That, take two cheese of the same flavor and the same physical appearance, the cheese that contains the most fat ought to bring the most money

The Chairman: It would bring the most money if the fat were separated.

Mr. De Land: The idea of having this test applied to cheese

as well as to milk, the theory is all right, but the buyer stands simply between the manufacturer and the consumer. We have to study the taste of the market that we are supplyng with goods. If they are taking a certain class of cheese and sending orders for more just like the last, they have to have it whether that cheese shows two per cent., three per cent. or four per cent. of fat.

The Chairman: Then do you give any encouragement for making a cheese rich in fat? Is there any sense in that talk of our's about putting the whole of it into the cheese?

Mr. De Land: It is a fact that the best cheese can be made with fat and the milk properly manipulating it's fat.

The Chairman: But do you discriminate between three, four or five per cent. fat in purchasing this cheese?

Mr. De Land: We do; the market does discriminate.

The Chairman: Now, how much? Remember, I am speaking of the fat alone.

Mr. Noyes: As far as the fat alone is concerned, it is about a half-cent a pound.

The Chairman: J. A. Smith made a standard cheese this last summer, containing thirty per cent. of fat, and when the fat was worth twenty-eight cents a pound, they sold the thirty per cent. cheese within three-eights of a cent of full cream. Now, that extra pound of fat ought to be worth twenty-eight cents, but you gave it only three-eights of a cent. How did the Plymouth Board discriminate? The three-eights of a cent will not pay the man for putting in that extra per cent. of fat. It will come fully fifteen cents short of it. Ten thousand pounds of milk was taken into that factory, the butter fat was determined by the Babcock test, and it run 4.1. The extractor stood right by, he wanted to make a thirty per cent. cheese, and he subtracted from that one hundred pounds of milk, twenty-five pounds of milk, and run it through the extractor, and when he got through, he had a thirty per cent. cheese, and had one hundred pounds of butter fat, and he sold the cheese on the market, and your discriminating buyers that pretend to pay for butter fat in cheese, paid within three-eights of a cent of the market-price

for full creams on the Board of Trade. Now, the market must stand up and acquit itself on this question, or else it must not ask men to put more fat into cheese.

Mr. Monrad: If a cheese-maker is receiving milk from fifty patrons, and one of those patrons takes good care of his milk and the others don't the poor care that one gives to his milk has no perceptible effect on the rest, is it any argument against that one patron taking care of his milk right I am certain that buyers would discriminate if they could know what they were going to buy, for instance, if they could buy a carload of four per cent. cheese, and know it is all four per cent; I believe they would pay the difference. The trouble is that one factory sells its cheese at an average, and the man whose cheese runs the highest in butter fat is not paid. The buyers are to blame in that case, it is true, but that is why I am in favor of co-operation among Boards. They are looking, not only for quality, but uniformity.

Mr. Gilbert: It is the cheese-buyer that needs education with the Babcock test. This same theory has cost the dairy men of the state of New York millions of dollars. I know one factory that was getting a fancy price for all the cheese they made. Their reputation was worth one cent a pound over other cheese in that neighborhood. They went to taking off twenty-five per cent. of the fat, still getting the same price. The next season everybody was talking about that factory—the money they were making. It started in the same way, but along toward the season, things began to change. I met the man that run that factory, and I said: "How do you get along?" And he answered: "Gilbert, there is something about that, that I never understood. Last year we got full price right along, and we sold three lots to one buyer, and he took and exported them. He came into the office a short time afterward, and I said: "I have a lot of Star cheese." And he replied: "I don't want it." I couldn't get rid of that cheese, and so I have lost money. And that factory was closed last year.

The Chairman: The buyer that bought the cheese didn't know enough to discriminate.

Prof. Henry: Now, we have got right to the point that I

may say something that don't sound very well, but I am going to say it. I am sorry that Uncle Joe Smith has run that factory and made that cheese, and published it in Hoard's Dairyman. I think it hurt the state of Wisconsin.

Mr. Hazen called to the chair.

Gov. Hoard: That is a challenge. I say it has benefited the state of Wisconsin. This idea that you can suppress facts, and still juggle with the truth, is all wrong. We have seen the indication of the judgment of the Plymouth market, when it's buyers were fools enough to pay within three-eights of a cent for cheese that was worth a great deal less.

Mr. Favill: Did the Plymouth buyers have all the facts before them?

Gov. Hoard: Yes; there was the word "Standard" marked right on that cheese.

Mr. Favill: Then the buyer did not look clear to the end. He new he could get it out of his hands onto some ignorant consumer.

Mr. Fargo: Are you in favor of adulterated food, Gov. Hoard?

Gov. Hoard: No, sir. If a man has one leg cut off, he is not adulterated.

Mr. Favill: He is certainly crippled.

Gov. Hoard: Now, our Wisconsin law is in the interest of the truth, and if you will let the thing stand, it will work itself clear. One of two things is true: either it is true that thirty per cent. of fat in the cheese will make a better cheese than forty per cent. or else it is true that it doesn't pay to put in any more fat than the buyer will discriminate and pay for. Now, put the thing where it belongs. If we have fool buyers, or dishonest buyers, let us do that which shall make those buyers more intelligent, for evidently they have not the force among themselves to make themselves more intelligent. Something is the matter with the commercial market. It is nonsense to talk about putting the whole fat in the milk, and then asking the men who put it there to bear the sole sacrifice. It is time we had grit enough to call things by their right names, and I am sorry for Prof. Henry, and the dairy school at Madison, if

they are going to talk theory up there, and not look the facts in the face. Put a Babcock test in that room, let the test determine the fat in every cheese, and the fat be paid for if everything else is equal. I say this thing should be made clear in every market, and if there is a skim cheese there, skimmed down to twenty-four or twenty-five per cent., let it stand there, and let the world know it, and let buyers pay for that kind of a cheese. My friends, we are on a line, which, according to my belief, needs agitation, and Hoard's Dairyman proposes to tell the truth wthout reference to any man or any set of men, the only thing it has ever surpassed has been it's own mistakes, and we all make mistakes at times. You must remember, my friend, Mr. Smith, in his management of that factory in that manner, did not make a false cheese.

Prof. Henry: Did the consumer get an honest cheese?

Gov. Hoard: Yes, he did; it was marked "Standard."

Mr. Favill: No; the customer got a little piece; he didn't know what it was marked.

Gov. Hoard: Who is responsible?

Mr. Favill: The man that makes it.

Gov. Hoard: I tell you when you mark that cheese and put it upon the cheese, mark it "Standard" and you give the per cent. of fat required, you have done all that you ought to do.

Mr. Favill: You forget that the mark is entirely taken away when it is on the retailer's shelf and the consumer's table.

Gov. Hoard: You are indicting the honesty of the buyer, not the maker.

Mr. Favill: There is dishonesty everywhere, but, we ought not to start it.

Gov. Hoard: That cheese was made and branded for what it was.

Prof. Henry: What is the use of making the butterine men brand their packages and tell the buyer it is butterine? Why not make the consumer find it out and go back and buy butter?

Gov. Hoard: You haven't a parallel case.

Mr. Adams: This is more fun than we have had since last night. But a very serious question has arisen, and I am surprised at the feeling which has been manifested by Prof. Henr

and Gov. Hoard, because in a certain sense, both of those gentlemen are right, and they will finally land on exactly the same platform. We know what the percentage is when we see "Standard" cheese, and it is not fair to charge the man who is making that kind of cheese with any degree of fraud. He is within the law in what he does, but Prof. Henry stands in another position and sees this thing. That kind of cheese is not the very best cheese, and when the cheese-marker makes that kind, he doesn't make the best kind, and he doesn't get the largest consumption, and Prof. Henry wants only that best cheese placed upon the market, so that people may buy it. I tell you your criticisms are too severe against the buyer. They are merely representatives of some house that sends them out here, and they say: buy so and so much cheese, they can't pay for the best cheese, and they get such cheese as they can and they send it in and it is distributed and those cheese are sent out and sold all over the United States, for more than they are worth, because people are fools enough to buy them. It is a question of business. If a cheese-maker finds he can sell a thirty per cent. for nearly as much money as he can a forty per cent. cheese, he will inevitably figure to his own interest, and the thing will remain just that way until we can make private individuals over.

Mr Gilbert: You have an example before you in the taking of part of the fat in the New York markets. You look to-day and see that Canadian cheese, for the last two years, has brought a penny a pound more than New York cheese. What is the reason of that? They make as good cheese, but they have got the repuation of partially skimming, some of them, and it has hurt them all. I know of cases where cheese have been sent to Canada and shipped from there, and they have got the price of Canadian cheese. I beg of you, look out for yourselves, in Wisconsin, and don't skim your milk. Your reputation is worth more than the difference.

Prof. Henry: I wish to ask the secretary to withdraw my statement in regard to Hoard's Dairyman. I am very sorry I made the statement in the way I did.

Gov. Hoard: No; Let it stand. There is no sensitiveness on my part, I assure you.

Prof. Henry: I don't think there is, but I am afraid it would reflect a little upon the great work that a great paper is doing. I don't want to do that but I do want to see every pound of cheese that goes out of Wisconsin, just as rich, and just as wholesome as it can be.

Mr. Monrad: That is just what I was going to say, that there is no one in this audience that would impugn the truth of Hoard's Diaryman, according to it's lights; but I tell you, that in this case, they are making the same mistake as the patron of the cheese factory, who says you can make more money by producing poor milk and getting it pooled in the cheese vat than by feeding right and delivering good milk to the cheese factory. What can you answer him. He is making more money. In the same way in Mr. Smith's factory, they are making more money. But, I say that that will not last; it only looks as if they were making more money because they are not looking far enough. To be sure, the cheese is marked "Standard", but how long does it remain "Standard"? If it remains "Standard" in this country, when it gets across the water, it will be thrown out.

Gov. Hoard: Who is to blame?

Mr. Monrad: I tell you, it is human nature; there will always be buyers and sellers that will eliminate this mark that you put on. Now, the effect comes back, and it re-acts on the reputation of Wisconsin. I talked with a cheese buyer in London, and I asked him: "What is the matter with New York cheese, and why don't you pay as high a price for it?" He replied: "It is the skimmer."

The Chairman: Am I responsible for those men changing the brand?

Mr. Monrad: You are responsible for not studying human nature, and acknowledging the fact that they are going to do it.

Gov. Hoard: You cannot hold the maker here in Wisconsin responsible for the fraud of the Chicago man. When you have made cheese which honestly brands according to the law of the state, out of milk which the farmers understand must hold a certain percentage of fat, and when you have told the buyer he

must mark it according to the percentage of fat, you can not do anything further, because, if you mark it "Full Cream, Wisconsin," the Chicago cheese buyer will take off your brand and mark it "Canada", and you certainly are not responsible for his dishonesty. Our law is not right yet. It is partially right. We should have a standard of fat in each cheese.

Mr. Favill: I want it to go out as the sentiment of this convention that it is not best for Wisconsin cheese-makers to make anything but the very best cheese that we can.

Mr. De Land: It certainly will not pay the state of Wisconsin to have one iota of the reputation that we may have, taken away from us for the sake of a few dollars. You agree with me in that, I presume, Gov. Hoard?

Gov. Hoard: Yes, sir.

Mr. De Land: Then, why advocate any skimming?

Gov. Hoard: Because you won't pay for it.

Mr. De Land: Why not make filled cheeses?

Gov. Hoard: That is a different thing altogether. That is an adulteration. It is not an honest cheese.

Mr. De Land: If it suits the palate of the customer, and brings a good price, these buyers have to conform to the demand.

The convention adjourned to meet at 1:30 P. M.

The convention met at 1:30 P. M. Mr. Favill in the chair.

The report on resolutions was received and adopted as follows:

1. Resolved: That the Wisconsin Dairymen's Association keenly appreciate the hospitality extended to the members of the twentieth annual convention, by his Honor, the Mayor, and the genial citizens of Oshkosh. Courage and confidence has been given the dairymen of the state by the evident friendliness of the business men of this city. Everything that the most ingenious could suggest, and the most painstaking and efficient could accomplish for the pleasure and comfort of the association, has been done. A magnificent city hall, perfect in all its appointments, from assembly hall to janitor and his assistants, has been unreservedly given up for the accommodation of the convention, and we shall ever gratefully remember the hospita-

ble welcome and royal entertainment received from beautiful and prosperous Oshkosh.

Resolved: That the thanks of the association are hereby tendered to the railroad companies for reduced fare, and to the local press for publishing extended and well-made abstracts of our proceedings.

Resolved: That the association appreciates and acknowledges the endorsement, by the last legislature, of the recommendations offered one year ago, upon the preservation and extension of the dairy laws of our state, and for appropriating a sufficient fund to establish and equip with buildings and apparatus, the best dairy school in the United States.

Resolved: That the duty of making official mention of the death of the Hon. Walter S. Greene, late of Jefferson County, and one of the founders of this association, and for many years, and at his decease, a member of the Wisconsin State Senate, is in some degree, relieved of its sadness by the fact that in connection therewith, we may place upon our records, a formal expression of the high esteem in which he was held by his fellow members as well as for his innumerable and attractive qualities as a citizen, friend and companion, as for the efficient personal endorsement and assistance cheerfully and at all times, given to promote the welfare and reputation of the Wisconsin Dairymen's Association, Wisconsin dairymen and Wisconsin dairy products.

Resolved: That the importance of a proper exhibit of Wisconsin's material wealth at the Columbian Exposition cannot be over estimated. Our people should be interested in this exhibition, not only as a matter of state and national pride, but, because it will give a splendid opportunity to advertise our resources of natural wealth, and to give to them a greater development. We are proud of the record the Wisconsin dairy interests have heretofore made in national exhibitions, and we earnestly urge upon the dairy men of the state, that they begin now to prepare for such an exhibit of dairy cattle and their products, as will not only maintain our reputation in this line, but extend it.

Geo. W. Burchard,
H. C. Adams,
H. C. Thom.

WHAT IS MEANT BY RIPENING CREAM? ARE BEST RESULTS OBTAINED BY THE PRESENT METHODS?

JOHN BOYD, CHICAGO.

We all understand very well what is meant by ripe fruit, and those of us who have eaten the mature peach or orange, ripened on it's native branch, can appreciate the full meaning of the word, in connection with fruit. The stock-raiser, who has brought his favorite steer to the highest state of perfection, full maturity, by a judicious course of feeding and handling, says the animal is ripe.

Up to a certain point, the fruit or the steers are unripe and immature, beyond that point, they grow stale. Shakespeare says:

"From hour to hour we ripe and ripe
"And then from hour to hour we rot and rot."

It is true, the term in connection with cream, is of modern application, yet, it has still a greater significance in the management of cream, because of its extremely perishable, complex nature.

I regard the ripening of cream as by far the most important operation in the art of butter-making, because it requires the most skill and judgment on the part of the operator.

If cream is not ripened sufficiently, there will surely be a serious loss, not only in quality, but also in quantity of butter in churning. The same is true if the cream is allowed to become over-ripe.

It is indeed, a very fine point to know just when cream has arrived at the best possible stage for churning, to insure perfect results in both quantity and quality of product. By the ordinary methods employed, that condition is an unknown quantity, and I believe will ever remain so if we must depend upon our sense of smell and taste, to determine. In fact, we can only guess at it, or the best we can claim, is to closely approximate it.

How wild our guesses have been, in fact, are to-day, is now being brought to light, so far as quantity is concerned, by the

use of Dr. Babcock's milk test. This method is a sure detective when applied to the buttermilk; it shows the losses in the buttermilk owing to imperfect ripening, to be very much greater than any one supposed, this test is revealing to us more than anything else, the great imperfection that has and does exist even now, in the highest state of the art.

The necessary change required to ripen cream, is a chemical re-action, produced by a lactive ferment, which sets free the butter gobules from the caseine and albumen that surrounds them in the cream more or less perfect in its results, according to the conditions surrounding the entire operation from first to last.

The ferment in cream is analogous in operation to that produced in brewing beer or making bread; good brewers and expert bakers, who have experienced the uncertainty of producing two batches of either exactly alike, will appreciate the difficulties in the way of butter-making, when they learn that cream ripening is a more complex and delicate operation.

There are two prime objects to be attained in ripening cream, first, to develop and preserve intact, the delicate aroma so much desired in butter, and second, to insure an exhaustive churning, by exhaustive churning I mean when the buttermilk tested by the chemical oil test, is shown to contain not more than two-tenths of one per cent. of butter oil; this may be called good work, although it is quite possible to reduce the loss in the buttermilk to one-half this amount, that is one-tenth of one per cent. I have proven this much in my own work, to my entire satisfaction, and on that this statement is made.

I will not attempt to go into the mysteries of the development of the aroma in the ripening cream for that, I believe, is beyond human ken, and at best, a matter of speculation. We know that the perfumer, who produces the rarest and most delicate perfumes, uses several ingredients that are of themselves, disagreeable to our sense of smell, yet, when carefully blended in proper proportions, delight the most sensitive olfactories.

So that it requires no great stretch of our imagination to believe that the flavoring acids found in butter, which are of

themselves, simply disgusting, are, in some inexplicable way, and in such proportions, released, developed and blended by the action of the lactive ferment as to produce the much sought for delicate aroma.

I know it is claimed for certain European experts, that they have discovered the microbe that is said to produce this delicate flavor. It is, however, my humble opinion, that bacteria are in no sense producers of this aroma, but simply acting on the substances in the cream, they release the flavoring acids in just sufficient proportion that when blended, delight the butter expert. Whether they owe their origin to a ferment in the milk itself, or are introduced from the air, is an undecided question. A famous French chemist has extracted a ferment from the mammary gland, which possesses the power to convert albumen into caseine, certainly qulte as extraordinary a result as that the milk should contain a ferment capable of producing lactic acid.

I have some ideas on the subject of flavor in butter, which I presume will call up a flood of opposition; but, careful observation and attention in my own dairy, afford me no other satisfactory explanation. I believe the aromatic flavor in butetr is perceptable to only one of our senses; that is, the sense of smell, and is in no way attributable to the food or water consumed by the cow. I believe not all the food in the state of Wisconsin is capable of producing this delicate aromatic flavor, valued so highly by the consumer.

Other flavors perceptible to the sense of taste and smell, come from the food and water consumed, and the healthful condition of the cow; for we know that if we feed cabbage, onions, musty clover, ensilage in certain conditions of fermentation, barley butts, rye or many kinds of food, they have a decided effect on the butter and can be detected by tasting and smelling, unless eliminated from the milk.

So also the flavors can be greatly improved by a selection of suitable foods and pure water, but in no case, can the flavors so produced, stand as a substitute for the delicate aromatic flavors so delghtful to the expert's keen scent.

The second prime object in ripening cream, that of the

recovery of the butter is very important to the manufacturer, for it is a plain question of profit and loss.

In the great dairy state of Wisconsin, the losses from this source alone, if recovered, would be sufficient to cover the entire cost of churning and working every pound of butter made in the state, and leave a large margin for other expenses beside.

The average loss of butter in buttermilk is stated by a standard authority, to be from five-tenths of one per cent. to seventy-five one hundredths of one per cent. I believe, however, that these estimates have reference to European work, for I know, from my own observation, that in a great many cases, the loss far exceeds the estimates, in both private dairy and creamery work, in fact, more than twice as much in many cases.

The average loss is almost impossible to determine with any degree of accuracy, because the variations are of daily occurrence, nearly as variable as the wind, or the changes of the temperature. The only way to arrive at any definite conclusion in this respect, is to apply the chemical oil test every day, making sure a fair average sample is taken for the test.

Without going into extreme cases, this test will show you a loss of all the way from fifty one hundredths to three per cent; the waste being much greater in the winter than in the summer.

It is difficult to convince creamery men of such losses as these, and next to useless to mention them to the average dairyman; yet it is these daily leaks that, appearing small at first sight, go to make up the great aggregate in the course of a season or a year.

Before the chemical oil test was introduced, no manufacturer of creamery butter would listen to a proposition looking to the saving of a part of the butter lost in the buttermilk, owing to imperfect ripening, even now, when the testing of buttermilk is reduced to the minimum, not only in expense, but also in time, the great difficulty is to get the testing done, they would rather plod along in ignorance and stand the loss, or make the other man shoulder it, than take the trouble to investigate. I have no doubt that this state of affairs will continue in the

majority of cases until competition actually drives the present occupant into a faithful examination of the losses in ripening cream.

DISCUSSION.

Mr. Gilbert: This is one of the most important questions that has come before this association. I venture to say that to-day, in the state of New York, the loss by improper handling of cream, is not less than ten per cent. of the whole amount, or ten per cent. between the profit and loss in the business. I want to say that when I first talked over this question of ripening cream and Mr. Boyd's ideas on the subject I repudiated his ideas, and I was finally converted not by faith, but by works. I tried it and I found that I was making equally as good quality of butter where it was closed and sealed from the air, as I was before, and before two months, I found that my average was increasing about a pound of butter a day by having the cream uniformly ripened. Every farmer, that is making butter for a living, should do something in this line. Under Mr. Boyd's system, you have control of the atmosphere. You go through the whole process by system and rule, and it does perfect work. I did not believe in any system, but I have found that it pays.

Prof. Roberts: Mr. Boyd, will you kindly give us a synopsis of your method of ripening cream?

Mr. Boyd: I simply take skim milk, the less butter fat it contains, the better, and bring it to a certain temperaure—90 to 95 degrees. If you increase the temperature to a hundred, you kill the ferment. You see it is a delicate performance. You produce the proper ferment at 90 or 92 degrees, and you kill it at 100 degrees. I then put it away in an air-tight vessel for twenty to twenty-four hours. At the end of that time, the ferment is ready, and I take that and put it into the cream at a temperature of from 68 to 70 degrees. That is covered up air-tight, and, in twenty-four hours, this has worked through the entire mass, so it is in one chemical condition from top to bottom. I do not stir the cream—that would retard fermentation, at

least, this kind of fermentation. It is necessary to hold it at that even temperature. When I first put in the starter, it is stirred, but not afterward; it is broken up very finely, so it will permeate the entire mass.

Question: How much of this starter do you put in?

Mr. Boyd: I put in two per cent., two gallons to a hundred. I break it up with a very fine strainer. When it is in perfect condition, it will have a very sharp acid taste and smell, but not a disagreeable smell, and it will be quite thick. You put it through a hair seive, work it all through the cream, and, at the same time, keep it in perfect agitation at about 70 degrees. My theory is, that you cannot develop a fine, aromatic flavor in butter at a low temperature. That cream will be ripe in twenty-four hours after the starter is put in.

Question: How do you maintain the temperature?

Mr. Boyd: I have apparatus for that purpose.

Question: Then your starter is simply what we used to call sour milk—thick, when we used to set our milk in pans?

Mr. Boyd: No; it is a ferment of a different kind entirely. Many people think that because cream is sour, it is all right, because it is acid. That is not true: there are different kinds of acid, different kinds of ferments in cream and I produce one single kind, not a half a dozen, which you will have in sour cream.

Question: How do you start it?

Mr. Boyd: It starts itself. My theory is that the milk itself contains the ferment. I have referred to that in my paper.

Question: By using your ferment, can I get that aroma into my butter, that you speak of of corn silage?

Mr. Boyd: I don't pretend to say that my ferment produces the aroma in the butter at all. I distinctly disclaim that.

Question: Where does it come from?

Mr. Boyyd: I say it comes from the cow.

Questionn: Then don't you feed it into her?

Mr. Boyd: No, sir.

Quesion: Do you milk it out of her?

Mr. Boyd: Yes; it depends upon he condition of the cow. A cow that is in advanced stages of pregnancy, there is no flavor in her butter at all.

Mr. Thorp: How can you prove that?

Mr. Boyd: I will tell you how I proved it. When I first went into the milk business, I didn't know anything more about making butter, than the man in the moon. I was running a farm, and breeding some Jersey cow, and I got interested. I invested some money in manufacturing implements and I said to myself: "Now, you have gone into business you had better find out something about making butter." And they had an exhibition of butter and cheese at American Institute in New York, in 1878, and I went down there, and I went to every gentleman who took a first premium, and inquired how they made their butter, and I found they all made it differently, no two of them alike; and when I got through, I didn't know any thing at all about it. I went back, and I went over the first question again. I went to Mr. Hiram Smith, and I said: "I want to know, Mr. Smith just how you made your butter?" And he very kindly told me all about it. He was running a winter dairy and I found that among them all they had only one thing in common and that was that their cows were fresh. That gave me a starting point and I went home. I had cows that were fresh and some that were not and I separated their milk and that is what started me on this revelation; and I am quite convinced from the many experiments I have made, that if you take cows in advanced stages of gestation, you cannot, by any process that I know anything about, put that aroma into the butter.

Prof. Roberts: What do you call advanced?

Mr. Boyd: It comes gradually. There is a period when it is simply oleomargine.

President Hoard took the chair.

The following committee was appointed to confer with the World's Fair commissioners, on behalf of the Dairymen of Wisconsin, and make proper arrangements and decide upon the scope of action.

D. W. Curtis, Chairman, Ft. Atkinson;

B. E. Sampson, Oakfield;

H. S. Weeks, Oconomowoc.

The President appointed Messrs. Stephen Favill, Chester Hazen and H. C. Thomas, as a committee on utensils.

REPORT OF COMMITTEE ON DAIRY UTENSILS.

Your committee find that most of the goods have been removed, as the convention was nearly closed, when the committee was appointed. The following firms had dairy utensils and supplies on exhibition: Cornish, Curtis and Green manufacturing company, Fort Atkinson, Wis., F. B. Fargo & Co., Lake Mills, Wis. D. H. Roe & Co., Chicago, J. H. Monrad, Chicago, Thatcher manufacturing company, Pottsdan, N. Y., A. J. Decker & Co., Fond du Lac, Wis., N. W. Webber, Fond du Lac, Wis., F. W. Tripp, Chicago; R. M. Boyd, Racine, Wis.

Respectfully submitted,

Stephen Favill,
Chairman.

CREAMERY EXPERIENCE IN IOWA IN 1891.

O. T. DENNISON, Mason City, Iowa, President Iowa Dairymen's Association.

Much has been learned from experience in 1891, by the Iowa creamery man, and some progress made in solving the problems involved in the successful operation of a creamery.

First, the Iowa creamery operator has learned that to be successful, and enlarge and build up his business, he must make dairying profitable to the producer of milk. "Herein lies all the law and the profits."

He has learned that the operator and the dairyman are joint partners in business, between whom there must always exist the most implicit confidence. They work together to add to the common fund of knowledge, from which each continually draws without reducing the capital stock.

The operator learns the patron's end of the business by breeding, feeding and milking cows himself.

He preaches of the benefits of feeding corn ensilage and shows his own silo as his text.

He seeds his own fields to clover and illustrates the value of a balanced ration and the truthfulness of the feeding tables with "cuts and diagrams" of his own "bias cut" corn ensilage and early cut and well cured clover.

He advocates the special purpose dairy cow and proves his faith by his works—he buys, breeds and milks some one of the dairy breeds of cattle.

He advocates the feeding of milk-producing foods, and furnishes his patrons with bran and oil cake meal in any quantity at the bare cost of carload lots. He studies his end of the business, day and night, and that his partners may study theirs, he buys and sends to each patron, for the year, the best of all dairy papers—Hoard's Dairyman. He practices Godliness and preaches "cleanliness," daily illustrating his meaning of the terms by keeping clean within and without, his creamery. He gives to his patrons the benefit of all improved methods and appliances, by using in his creamery the latest improved machinery for the handling of milk and making of butter.

That his patron may not despair of keeping up his herd of good milkers of his own raising, he scalds the separated milk and returns it to the patron in condition that it remains sweet twent-four hours in hottest weather.

He watches the markets and sells in that which brings him continually the best price, and by making butter of uniformly fine quality, builds up the trade with customers who wait the arrival of his "mark."

He encourages the breeding and feeding of great butter-producing cows by paying for milk according to it's butter value, and by the one and same process takes away a great temptation heretofore in the pathway of the dairyman and does equal and exact justice to each patron.

He studies bacteorology and the changes in milk produced by the various bacteria and the endless complications resulting from their work in varying temperatures.

I have described to you the ideal Iowa creamery operator, and I must confess to you, not all come up to this high standard of excellence. Many are striving to do so. In particular, the Babcock test

is being very largely introduced, and gives universal satisfaction to the patrons, and many creameries have heated the separator skim milk to one hundred Fahr. degrees during the warm months, and this also gives great satisfaction to patrons and creameries.

During December we have daily taken a sample of milk from that brought by each patron, preserved it in a glass jar with corrosive sublimate, and from the composite sample tested two samples with the Dr. Babcock test, and by this we pay each patron his pro rata share of money. All this has been done with extreme care, and we have taken many individual tests during the month and the results compare closely with the composite tests. The highest per cent. of fat is 5.7 and the lowest 2.95. Five patrons brought milk of 5. per cent. fat or over, and they brought but little over 2 per cent. of the total milk. Eight samples are 4.5 per cent. or over and represent less than 5 per cent. of the entire milk; 28 per cent. of the milk tested 4 per cent. or over — and the average of total butter fat to all milk is 3.87. The butter churned and sold in New York was 16 per cent. more than the test butter fat, showing that we put into the butter 16 per cent. of water, salt and caseine of water, salt and caseine. Water in butter varies from 10 to 24 per cent.— usually is about 15 to 18 per cent. The highest price paid for 100 pounds of milk is $1.48, and the lowest 77 cts. The per cent. of all butter sold to total milk is 4.46.

We have decided to continue the test plan with all who desire it. If patrons desire to pay more for butter than their milk contains, and objects to the test plan, and enough can be found of this mind, we will put in another vat and "pool" all who desire it, running this mill entirely by itself. In case patrons are satisfied with neither one of these plans, they still have the other alternative.

I find in every case of high per cent. of fat in sample it is from strippers or cows long in milk, "and the question of how long the cows have been in milk cuts far more figure in the per cent. of fat than does the matter of feed, breed or any other one thing, and as the "flavor" of butter from milk of a fresh milch

cow is what the buyer pays high for, a question arises which I am not able to answer, viz: what per cent. of fresh milk flavor equals one per cent. of butter fat of stripper's milk?

DISCUSSION.

The Chairman: One point in particular I want to question him upon, and that is, how the arrangement is made for heating the skim milk of the patron, sterilizing it as it leaves the creamery, so that its feeding value is maintained for twenty-four hours in the hottest weather.

Mr. Dennison: In my own creameries we use live steam directly from the boiler, to scald the milk as it runs from the separators into the galvanized iron vat, and the factory is so arranged that the milk runs from the separators into the vat, and from this vat into the tank without lifting. By turning on the steam to just such an extent as is necessary when we are using one, two or three separators, the operators soon become accustomed to it, so that they can heat the milk up to 150 degrees, and it remains perfectly sweet, so far the taste can discover, until the afternoon of the next day—oftentimes forty-eight hours.

Question: After that milk is heated up, does it separate into clots?

Mr. Dennison: Not at 150 degrees. You can separate the caseine from the water by heating it hotter than that. We start it at 140 degrees, but we thought we would be on the safe side and put it 150 degrees.

Mr. Favill: What is the cost of the necessary apparatus to do this in a factory, that is taking, say 8,000 pounds of milk a day?

Mr. Dennison: Why, we have simply a tank, it didn't cost us fifteen cents to put in the apparatus to do it. Our tank is a regular skim-milk tank, and we just turned a three-quarter inch pipe directly into the tank.

A Member: Mr. Newton uses the exhaust steam and throws it into the pail, and it turns over into the vats, keeps heating the milk.

Mr. Favill: Have you ever made any estimate of the cost of coal or steam to keep that thing running, per day?

Mr. Dennison: As I estimate it, it costs us about fifty to seventy-five cents a day when we are running fifteen to twenty thousand pounds of milk. It is merely nominal; we are glad to do it for our customers. I prefer to use the exhaust steam to heat the feed water from the boiler, rather than use it directly in the skim milk. I prefer not to interfere with the speed of the engines on account of the separators. I have, in one factory, a forty-horse power boiler, and in the other, a twenty-horse power; and we are running about ten to twelve thousand pounds of milk during the hot weather.

Mr. Noyes: There is a jet pump, I believe, at present, that is so constucted that you can raise your skim milk or butter milk, to any temperature you wish, and it don't take any extra steam at all. The heat that lifts it, heats it.

Prof. Henry: What is the name of this piece of apparatus that does the lifting?

Mr. Noyes: It is sold by Sharpless men; it is a steam jet pump.

Mr. Dennison: The heating of the skim milk is a very valuable thing. In separated districts, like our locality, the great obstruction to our business has been that the milk became sour and unfit to feed to young calves, and this arrangement has obviated that trouble.

CREAMERY MANAGEMENT.

E. W. WASHBURNE, OSHKOSH, WIS.

It is not creditable for any one to lie. Neither is it always judicious for him to speak the truth. Sometimes it may be better to refrain from speaking at all—to maintain an omnious and significant silence—especially when the truth would he unpleasant to either speaker or hearer. The experiences to which attention is invited will have no reference to financial results. To confess that mine have been disastrous, or in any degree unsatisfactory, might involve the apprehension that

want of skill or judgment or business capacity was in some way involved. A sort of confession that the average individual would prefer to be excused from making. To say that results have been highly satisfactory and largely lucrative, might tend to lead some of the innocents into experiments to them new and untried to their mortification, sorrow and loss.

That some have engaged in this business with a fair degree of success, is believed to be true. Nor can it be doubted that others have been obliged to suspend and abandon a meritorious effort to place before the public more choice and satisfactory samples of the prime necessities of the table, and to replenish the pocket of the patron with more dollars and cents than can be done from the product of the average diary.

It has not been very long since all the butter and cheese in the country was produced on the farm. The care of the milk and cream and the labor of churning, working, salting and packing the butter and of making, pressing, turning and greasing of the churn devolved upon the wives and daughters of the household.

Some of this butter and cheese was essentially bad from the beginning. More of it in the course of time became deteriorated in quality so that when it reached the table of the consumer that it was anything but a wholesome and palatable article of diet.

The bad condition of a considerable portion of the products of the dairy could but provoke more or less resentment on the part of the consumer and result in a continued and persistent effort to devise radical and heroic remedies. Taste and sensibility could but vigorously protest against imposition in the sale of dairy products and stimulate endeavors for relief in more ways than one. The production of imitation butter of various grades and different methods of manufacture is one of the inventions, the ingenuity of man has devised for the relief of a patient and long-suffering community.

That trade has reached enormous proportions—has run far up into the millions, and that fact must be accepted as the most unimpeachable evidence that it is more acceptable to the

public and more satisfactory to the consumer than much of the genuine butter that finds its way into the market.

Assuming that the average consumption of butter in the United States is one-half pound per week per capita, an annual supply would require 1,300,000,000 lbs., and its value at twenty cents per pound would be $260.000.000. Every pound of fraudulent or imitation butter displaces just so much of the genuine article—consigns it to the soap maker and reduces the value of the whole butter product of the country.

An effort has also been made to improve the quality of the genuine article and place it in the hands of the consumer, when in the best condition for immediate use.

Creameries have been built in large numbers all over the country, where better care and skill is obtainable, than is possible when the work is entrusted in too many hands. Care, cleanliness and skill may prevail in one dairy, and carelessness, ignorance and uncleanliness in another, and the combined results must be unsatisfactory to a great degree. Filthiness is a complete obstacle to success in the managment of a dairy.

There must be more combined effort—more factories for the manufacture of butter before the fraudulent article is forced from the markets. And especially must its production be more uniform from the beginning to the end of the year.

Taxation and legislation thus far, have failed to make a very decided reduction in the manufacture of spurious butter. I doubt if much will ever be accomplished by such methods.

The effort should be to give the public a better genuine article—to give it to them not only in Summer, but in Winter —every month and every day in the year.

There is ordinarily little difficulty in procuring satisfactory dairy butter in Summer, when most of it is made. But, before Winter, the accumulated surplus over the daily requirments of the country becomes unfit for use, and people are driven to buy hog fat and soap grease, melted, with the vileness somewhat neutralized or abstracted, but all put in neat and convenient packages, and for sale at a very moderate price.

It is better to squarely face the music and proceed without delay to the only practicable method of exterminating all those

vile and fraudulent imitations, which is to give to the public genuine butter so excellent and so acceptable that they will turn up their noses in holy horror and intense disgust at the combination of greases that are imposed upon the country to-day and that are designed to be accepted in lieu of one of the choicest products of the farm.

While combination has thus far accomplished something, much remains to be done. There is altogether too much disposition to multiply the number of small factories, instead of concentrating the entire product of a community at one central station, where it all can be handled economically and advantageously.

A factory where a limited quantity of milk or cream is availabe necessitates economy in the construction of the buildings, in the purchase of desirable apparatus, and of the daily supplies in constant use and more especially in the employment of labor at the most moderate rates. Cheap help means cheap in more senses than one. It means not only that the operator must be content with small wages, but the factory must be content with ignorance and stupidity, as well as a low grade for its product and small returns for its patrons.

The larger the amount of milk or cream available for one factory, the less is the cost per pound of its manufacture; the greater the ability of the factory to command the services of the most competent, skillful and intelligent help; the more certainty of ensuring a product of the highest grade that will command the best price in any market in the country.

A creamery should be advantageous to both patron and proprietor. It should afford the patron as much or more money than he can obtain from his dairy in any other manner, and it should also afford the proprietor some compensation for the use of his building and the apparatus necessary in handling the milk or cream in making, working and packing the butter: the wages of laborers, the cost of coal, salt, tubs and numerous other things indispensable about such a factory.

The amount of material available should be sufficient to justify ample compensation for the most competent workmen, and other necessary expenditures without making too serious

inroad into the fund from which the patron must receive his compensation.

Material for three hundred pounds of butter daily, if to be had in a reasonably compact territory, can be handled nearly as cheaply as material for one hundred pounds only—no additional cost for fuel or labor.

A small factory is likely to be unsatisfactory to both patron and proprietor, while a large one should be equally advantageous and satisfactory to both.

To insure moderate success, these things are indispensable.

1. An abundance of milk or cream.
2. The highest skill possible to obtain.
3. The sale of the product where the very highest price can be had.

The butter should go as far as possible, direct from the factory to the consumer, and not through several hands; each of which, one after the other, must abstract something of its value before it reaches the table where it is destined for use.

It is certain that a well conducted creamery may be instrumental in accomplishing some good. It can furnish the public, butter fresh from the churn, every day in the year. Butter that has not been kept until the taint of decomposition has struck it through and through—butter that is uniform in quality, in color, in texture, in flavor and in taste.

It saves the patron the care and labor of churning, working and marketing the butter; of washing, churning and carrying for the divers and sundry utensils necessary for use, as well as the cost of their original purchase and of replacing them with others from time to time as occasion may require.

The saving of money and labor to the farmer and his family together with the increased price at which good fresh creamery butter will sell in the market over and above the price at which the average dairy butter will sell, should much more than afford adequate compensation for the use of building and the cost of operating a creamery.

One of the serious difficulties to be encountered by the operator of a creamery is the extreme low price at which the very best butter in the country has to be sold at some seasons

of the year. The three months of May, June and July will furnish as much butter as the other nine months, and its consumption in those three months should not be materially larger than in a like period of time in any other portion of the year. It doubtless would not be. Did not the extreme high prices of Winter, tend in some degree, to induce more or less economy in its use.

When the product is the most abundant, the price is reduced to an extreme low figure, and the remuneration to the patron is inconsiderable, insignificant and unsatisfactory.

When Chicago and New York cannot pay more than thirteen or fourteen cents for the best creamery, there are few establishments that can assure their patrons more than nine or ten cents.

It is then that the farmer hesitates, and considers whether he had not better return to his old methods—make, pack and hold his butter until an upward market shall encourage him to hope for better results. Or, he may go in search of special customers in private families, in the towns and cities that in the expectation of a steady, constant supply for the season, will be ready to contract at a figure somewhat above the general market. So the factory looses a patron, and then another and another, until the number becomes so much reduced that with the constantly diminshing quantity of milk as the season advances, the operators become unsatisfactory and unremunerative.

Perhaps the patron will take his milk to the nearest cheese factory for a short time, because the cheese that his milk will produce will bring him more money than the butter that can be produced from the same milk.

He does not stop to consider that the feeding value of his skim milk is from twenty to twenty-five cents per one hundred pounds and though he may receive less money for his butter than he would for the same milk made into cheese, he gets more for his calves and his pigs. And he may not consider either that as a rule, there are not more than three months in the year, and probably not more than two, when the cheese made from his milk will sell for more money than butter, made from the same

milk, and that for the other ten months the advantage is decidedly with the maker of butter, rather than with the maker of cheese.

In the early days of butter making in factories, cream was gathered by drivers from the several farms contiguous to the factory and its value to the farmer was determined by measure.

But, because there was found to be so great a difference in the amount of butter produced from different samples of cream that method of proceedure became unsatisfactory, and another method was adopted of taking samples of cream from every farm, churning it seperately, ascertaining the quantity of butter it would produce, and giving to the farmer for the whole quantity of his cream the same percentage of butter as was produced from his sample.

The taking of the sample for the test is the work of the driver. If he fails to thoroughly mix his cream before he takes his sample, either because he fails to comprehend the necessity for care and accuracy in that respect, or because he is too indifferent or lazy, correct results cannot be obtained. It is the sample that is actually tested that controls the credit given the patron. If the driver fails to do his duty faithfully, somebody is likely to be the gainer and another one the loser.

The top half of a deep can of cream is richer in fat and will make considerable more butter than the bottom half. And, unless the cream is so thoroughly mixed, as to have just as much fat in one half as in the other, the yield from two samples of cream from the same can will not be alike.

Patrons are sometimes suspicious, not only of the accuracy, but of the honesty of creamery methods. They sometimes will churn one half of their cream and send half to the factory. Sometimes they will send one day's cream and churn that of the next day at home. I have known some patrons who have experimented in this way, say that the factory gave them credit for more butter than they could churn themselves. Others, that their own churns served them better than that at the factory, and still others that they could discover no essential difference in the yield, whether the churning was done on the farm or at the factory. But the patron who thinks he

discovers results adverse to himself, is apt to condemn the factory methods as unreliable and inaccurate, either from the irate viciousness of the system or the carelessness and indifference of the operator, unless, perhaps, he would jump at the unkind conclusion that the factory was engaged in a deliberate and persistent attempt to cheat him in a small way out of what was justly his own.

But, whatever he thinks, he is liable to drop the factory as an undesirable institution for him.

If absolutely correct results cannot be had by the use of the oil test, it will approximate accuracy much more nearly than any other method the ingenuity of man has been able to devise.

At the Oshkosh creamery, there was made in one year, 100.527 pounds of butter. The difference between the actual weight of the butter when it came from the churn and what there should have been from the test, was one-third of one per cent.

It actually weighed at the factory that much more than the test called for. But when it reached the market, where it was consigned for sale, the weight shrank about one per cent. from the factory weight, so that the patrons actually received two-thirds of one per cent. more in weight than was realized by the factory.

This difference is so inconsiderable that it should not be the subject of serious complaint from any quarter.

It is a gratifying reflection that while the world is moving with gigantic strides, making astounding advances in the arts and sciences, the work of dairying has not been neglected.

Men of intelligence and culture have been giving the subject their thoughtful attention for years. This association and other kindred organizations elsewhere, have been instrumental in the dissemination of much useful knowledge. By the tongue and the pen and other agencies at their command, they have inspired the dairymen of the land with the praiseworthy ambition to strive for the most complete excellence in the product of their dairies.

They have instigated much useful and wholesome legislation, all tending to encourage well directed efforts and raise this

department of agriculture to the dignity of one of the fine arts. The state of Wisconsin if not foremost among all the states in the promotion of the interests of agriculture, is behind none of them in this respect.

It should be a source of gratification and pride to every citizen of the state that its University can see it in the line of its duty to devote some of its talents, its brains, its energies to encourage and assure improvement in every department of work known to the farm. People may sneer at gentlemen farmers, and book-learning, and going to college to learn how to raise potatoes if they will, but few men are so stupid that if they come in contact with those of more brains and intelligence than themselves do not go away with some idea that was new to them before and that may be useful to them in the future.

Prof. Roberts explained some charts and drawings, representing different methods of building barns, and also showing the different amounts and qualities of milk given by certain cows, in late experiments. The drift of the professor's remarks was strongly in favor of testing and weeding out poor cows, that he urged upon the members to be careful to remember that the amount of butter fat as shown by the test was simply one factor, and that the profit of the animal to her owner depended quite as much upon the quantity of her product as the quality.

SECRETARY'S REPORT.

Mr. President and Members of the Convention:—

The work of the association for the past year, will compare favorably with the work done in previous years.

The executive committee met at Fort Atkinson, April 30th, to arrange the work of cheese-instructing for the coming season. It was decided to employ these instructors, and the president, secretary and treasurer were empowered to hire the instructors, and set them to work, and to each factory, where instruction was given, five dollars should be paid the instructor, to help in part, to pay his expenses, that the work might be continued later in the season.

W. H. Phillips was assigned to Richland county, the same as last year, but visited many other fatories in adjoining counties, during the season.

T. J. Fleming's work was in Green Lake county principally, visiting factories, as time would permit where he had given instructions the year previous.

Graff E. Miles, worked in different parts of the state, where he was needed the most.

The work done by the instructors gave general satisfaction There seems to be an increasing demand among factorymen for instructors, especially in the first part of the season, after the weather gets warm. It was impossible to send instructors for all of the calls made, during the warm weather, as the territory is too large for the force employed.

If it were possible to divide the state into districts, and have an instructor for each district, better work could be done, but the funds at the present time will not allow it.

Commission men speak very highly of the improvement made in the cheese product, where instruction has been given. An old commission merchant said that there had been a "wonderful improvement in Richland county cheese in the last two years." The liberal appropriations made by the state, is believed to have been returned many times over in the increased value of the cheese products. The expenses of my office during the past year has been $109.57.

An itimized account has been furnished to the executive committee.

Respectfully submitted,

D. W. Curtis, Secretary.

TREASURER'S REPORT.

Mr. President and Members of the Association:

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

Amount in hands of treasurer	$1,499 32
Membership	101 00
Aug. 15. Received from state treasurer	1,000 00
Total receipts	$2,600 32

DISBURSEMENTS.

Hotel bill of workers			$60 75
March	14.	D. W. Curtis, express on reports	2 00
		A. Schoenman, expense attending Berlin meeting	5 35
		J. B. Harris, expense attending Berlin meeting	4 83
		S. Favill, expense attending Berlin meeting	4 31
		W. A. Henry, expense attending Berlin meeting	6 23
		John W. Decker, expense attending Berlin meeting	4 22
		H. S. Weeks, expense attending Berlin meeting	4 50
		H. K. Loomis, expense attending Berlin meeting	4 60
		C. R. Beach, expense attending Berlin meeting	7 13
		H. C. Adams, expense attending Berlin meeting	5 13
	9.	Mrs. R. Howard Kelly, reporting meeting	85 50
	14.	G. W. Thompson, expense attending Berlin meeting	7 00
		H. W. Kellogg, premium	5 00
		S. W. Richardson, premium	3 00
		Chas. Thorp	10 00
March	14.	O. G Peterson, premium	7 00
		E. L. Eastman, premium	15 00
		H. M. McLelland, premium	5 00
		W. B. Cockerell, premium	3 00
		Mrs. H. Churchyard, premium	1 50
		John W. Decker, premium	7 00
		J. R. Wilcox, premium	5 00
May	14.	A. T. Higby hotel bills of ex. com	4 50
	16.	Cornish, Curtis & Greene, milk tester for instructor	15 32
	22.	Blomgrew Bros. & Co., engraving for report	7 20
	29.	W. D. Hoard, printing	11 45
June	4.	E H. Powell, drawing plans for report of cheese factories	5 50
		W. A. Henry, expense attending ex. com. meeting April 30th	1 92
		H. K. Loomis, expense attending ex. com. meeting April 30th	6 92
	22.	W. H. Phillips, instructor	65 00
		T. J. Fleming, instructor	88 00
July	6.	W. H. Phillips, instructor	85 00
	23.	T. J. Fleming, instructor	70 00
Aug.	8.	W. H. Phillips, instructor	90 00
	15.	Graf. E. Miles, instructor	17 00
	24.	T. J. Fleming, instructor	110 00
Sept.	7.	Graf. E. Miles, instructor	18 00
	8.	W. H. Phillips, instructor	90 00
	14.	T. J. Fleming, instructor	115 00

Oct.	12.	Graf. E. Miles, instructor	$35 00
	19.	W. H. Phillips, instructor	100 00
	30.	W. H. Morrison, prints of Hiram Smith	22 00
Oct.	30.	Graf. E. Miles, instructor	20 00
Nov.	6.	Hotel bills ex. com. at Fort Atkinson	5 00
	10.	W. H. Phillips, instructor	80 00
		W. H. Phillips, instructor	30 00
	29.	D. W. Curtis, secretary, salary	250 00
Dec.	2.	S. Favill, expense attending ex. com. meeting, Nov. 6	3 17
	26.	W. D. Hoard, printing letter heads	5 00
	31.	H. K. Loomis, expense attending ex. com. meeting Nov. 6	7 20
1892.			
Jan.	8.	D. W. Curtis, expense to Oshkosh to arrange for convention	7 82
		H. K. Loomis, expense to Oshkosh to arrange for convention	7 90
Feb.	1.	H. C. Adams, reading proof for report	10 00
		A. D. DeLand, expense attending ex. com. meeting Nov. 6	5 00
April	23.	W. H. Morrison, engraving for annual report	12 00
		W. D. Hoard, printing	39 42
		Hotel bills ex. com. at Highy house	5 00
		F. G. Short, expense attending Berlin meeting	3 00
		The Hicks Printing Co., printing membership cards.	11 00
		D. W. Curtis, expense of secretary's office for 1891	109 59
		Postage and exchange on drafts	6 46
		Balance in hands of treasurer	761 90
			$2,600 32

Respectfully submitted,

H. K. LOOMIS,

Treasurer.

The treasurer's report was submitted to the executive committee and by them approved.

AWARDS ON BUTTER AND CHEESE.

CLASS I.—DAIRY BUTTER—FIRSTS.

First premium ..... Angus & Humphrey, Oshkosh.

Also wins special premiums offered by the business men of Oshkosh.

Class I, first premium, Wm. Dichman, grocer, 5 lb can baking powder $2 25

Class I, first premium, M. Lampert & Co., boots and shoes, pair ladies shoes 5 00

Score — 94.

Second premium.....John Rowland, Portage.
Also wins —
Class I, second premium, E. R. Jones, dry goods, ladies muff. $3 00
Class I, second and third premiums, Hicks Printing Co., Pub. Northwestern, 2 subscriptions to the Weekly Northwestern for 1892..... 2 50
Score — 91.

Third premium..... Mrs. N. E. Allen, Beaver Dam.
Also wins —
Class I, second and third premiums, Hicks Printing Co., Pub. Northwestern, 2 subscriptions to the Weekly Northwestern for 1892..... 2 50
Score — 90.

CLASS II.— DAIRY BUTTER — SECONDS.

First premium.....C. R. Smith, Zion, Wis.
Also wins —
Class II, first premium, Bauman & Co., druggists, jewel casket..... $2 50
Class II, first premium, Evans Bros., grocers, 5 pounds tea.. 3 00
Class II, first premium, A. Kuemsted, Clothier, silk plush cap..... 3 00
Score — 94.

Second premium..... H. S. Weeks, Oconomowoc.
Also wins —
Clas II, Second premium, I. A. Froellch, druggist, toilet set.
Score — 91.

Third premium.....John Rowland, Portage.
Also wins —
Class II, third premium, Angus & Humphrey, wholesale dealers in cheese and dairy implements, box picnic cheese. $3 00
Score — 89.

CLASS 3 — CREAMERY BUTTER — FIRSTS.

First premium.....Waukesha Dairy and Produce Co., Waukesha.
Also win —
Class 3, first premium, Wyman & Cardiff gents furnishers pair gloves..... $2 50
Class 3, first premium, J. F. W. Decker, crockery and glassware, cut glass-ware..... 3 00
Class 3, first premium, F. H. Josslyn, dry goods, suit underware..... 3 00
Score 96.

Second premium.....Robert Wittke, Beaver Dam.
Also win —
Clsss 3, second premium, J. E. Holden & Co., dry goods, rug 3 00

Score 93.

Third premium.....F. H. Schriber, Rosendale.
Also win —
Class 3, third premium, L. Strauss & Co., boots and shoes, pair slippers 2 50

Score 84.

Lowest score, class three wins, Clark's Syndicate, dry goods, 1,600 page hymn book 3 00

Score 80 — W. R. Williams, Oshkosh, 56 West Irving street.

CLASS 4 — CREAMERY BUTTER — SECONDS.

First premium .....Waukesha Dairy & Praduce Co., Waukesha.
Also win —
Class 4, first premium, Weber Bros., dry goods, chenille square..... $2 50
Class 4, first premium, S. M. Hay & Bro., hardware, three dairy pails 2 00

Score 95.

Second premium.....Robert Wittke, Beaver Dam.
Also win —
Class 4, second premium, E. A. Horn, druggist, album ... 3 50

Score 93.

Third premium.....W. R. Williams, Oshkosh.
Also win —
Class 4, third premium, Hall and Hawthorne, fancy goods, lamp 2 50

Score 87.

CLASS 5 — PRINT BUTTER.

First premium.....Mrs. N. E. Allen.
Also win —
Class 5, first premium, Stroud Music Co., violin $15 00
Second premium, Miss Kate Peffer.....Pewaukee.
Also win —
Second premium, Birely & Son, jewelers, castor 3 50
Third premium..... John R. Washburn, Oshkosh
Also win —
Class 5, third premium, N. Simon & Co., wholesale cheese dealers, Neenah, cheese 3 00

CHEESE — CLASS 6 — FIRSTS.

First premium — A. D. De Land, Sheboygan; also wins jeweler clock offered by R. Banger & Co., Oshkosh; fancy goods album offered by Church Bros., and one half dozen milk pans offered by K. M. Hutchinson. Score, 97.

Second premium — Angus & Humphrey, Oshkosh; also win furniture picture offered by B. H. Soper. Score, 95½.

CHEESE — CLASS 7 — SECONDS.

First premium — J. J. Clark, Berlin, Wis.; also wins furniture chair offered by William Spikes. Score, 96.

Second premium — W. G. Calkins, Winneconne; also wins carpet sweeper offered by O. McCorrison, set of McCauley's History offered by John Hurn. Score, 95¼.

Third premium — Angus & Humphrey; also wins brussels rug offered by Hough & Topliff. Score, 92½.

CHEESE — CLASS 8.

Angus & Humphrey win the silver cup offered by Geo. S. Hart & Co., New York City.

The previous winners of the silver cups are: A. H. Weaton, Auroraville, 1878; Olin & Clinton, Waukesha, 1879; W. S. Baker, Cold Spring, 1880; H. A. Conger & Son, Whitewater, 1881; August Cleasing, Centerville, 1882; Marr & Dyer, Whitewater, 1883; E. P. Ingalls, Milford, 1884; H. Z. Fish, Richland Center, 1885; T. P. Fish, Richland Center, 1886; Burns Cheese Association, Burns, 1887; H. Z. Fish, Richland Center, 1888; S. Fish, Cazenovia, 1889; W. H. Porter, Marshall, 1890; J. W. Decker, Madison, 1891; Angus & Humphrey, Oshkosh, 1892.

HOW TO SAVE AND APPLY MANURE.

PROF. I. P. ROBERTS.

(Director Cornell University Experiment Station, Ithica, N. Y.)

Before discussing "How to save manure" we might ask, is it worth saving? Judging by the practices of a large number of farmers, we would conclude that it is not worth "bothering with." If from one to two dollars loss a day was incurred from the leaking of a grain bin, we should feel that the owner was a

lunatic if he made no intelligent effort to prevent it. But, if the same amount of loss is daily incurred by unnecessary waste of manures, we call the proprietor sane and let him remain at large without a guardian. The land may suffer, the children go bare-footed, and the wife work for her board on account of this insane squandering, but the law takes no account of this, unless the man is dangerously violent.

WHAT QUANTITY OF MANURE IS PRODUCED BY VARIOUS CLASSES OF ANIMALS IN A YEAR.

Boussingout's estimates of the quantity of manure produced by clasess of animals are as follows:

Horses — 900 pounds. Liquids, 12,000 pounds. Solids, 3,000 pounds. Equal to 7½ tons.

Cows — Liquids, 20,000 pounds. Solids, 8,000 pounds. Equal to 14 tons.

My first attempt to determine the amount and value of the manure by our farm animals was made in the winter of 1884. The animals kept at this time were estimated to be equal to forty-five mature animals, about two-thirds of which were cattle and one-third horses. The manure was kept in a covered yard, every tenth load was weighed and the total weight made up from the averages of the weighed loads. About ten pounds of manure was taken from each load, and these constituted the samples for analysis. Computing nitrogen, phosphoric acid, and potash at 15, 7 and 4.25 cents per pound respectively, the value was found to be $3.61 per ton. The total number of tons produced during about seven months of feeding was 466, or a trifle over ten tons per animal. This includes a liberal amount of bedding, which was used in the stables. The results of multiplying the number of tons by the price per ton were so surprising, showing $1,682 as the value of the winter's output of manure, it was decided to repeat the investigation the following winter.

From October 1st to March 1st, fifty-seven animals of various ages, estimated to be equal to forty-seven full grown animals of 900 pounds each, produced a few pounds less than 200 tons of

manure in five months. The manure, as before, was kept in a covered yard, the ration was somewhat wider and the bedding less abundant than the previous winter, and every load of manure was weighed. Analyses of the mixed manure showed a value, computed as before, of $3.05 per ton, and $610 for five months' output. In another experiment, three large cows produced in three days 802 pounds of manure; including 45 pounds of bedding; or 89½ pounds per cow and day. At the same time, these cows were giving 31⅔ pounds of milk per cow per day.

The food the three cows ate in three days and the bedding contained 7.74 pounds of nitrogen, 54.65 pounds of potash and 3.27 pounds of phosphoric acid, which was worth at the prices given previously $1.59, or 17 cents per cow a day. This is rather an exceptional case and it should be observed that the usual 20 per cetn. has not been taken out, which if done would leave the estimated value 13.6 cents per day a cow.

Last year, eighteen large Jersey and Holstein grade cows in milk produced in twenty-four hours 1452.5 pounds of manure, which, when analyzed, showed a value of $2.46 per ton, or the manure produced in one day from eighteen liberally fed cows showed a value of $1.78. Later I will have something to say as to reducing these estimated values to what my judgment tells me is more nearly the real values. I might say just here, in order to prevent any misconception, that after many years of careful observation, I concluded that it is safe to value the nitrogen, potash and phosphoric acid in farm manure at one-half of the price which the soluble constituents sell for in the form of commercial fertilizers. Applying this rule to the above the modified valuation would place the true value of the manure produced by eighteen cows in twenty-four hours at 89 cents; well, even such an amount per day shows $178 value in 200 days of winter feeding of eighteen cows.

QUANTITY OF MANURE PRODUCED PER DAY BY VARIOUS KINDS OF ANIMALS.

Exclusive of bedding—

Cows, per day	81 lbs
Cows, per day	82 lbs
Cows, per day	84 lbs

At work 10 hours—

Horses, per day	31.5 lbs
Horses, per day	56.0 lbs
Horses, per day	51.0 lbs

Exclusive of bedding—

Sheep, 140 lbs	7.5 lbs
Swine, 150 lbs (fed on narrow nitrogenous ration)	5.2 lbs
Swine 150 lbs. (fed on wide carbonaceous ration)	1.7 lbs

SHEEP.

Maintenance Ration.

Rams, manure per sheep per day	5 6 lbs
Rams, " " 100 wt. sheep per day	3.6 lbs
Ewes, " " sheep per day	3.49 lbs
Ewes, " " 100 wt. sheep per day	2.96 lbs
Rams, " " sheep per day	4.71 lbs
Rams, " " 100 wt. sheep per day	3.18 lbs

CALVES.

Manure per calf, per day	10.3 lbs
Manure per 100 wt. calf, per day	3.6 lbs

MILK FED.

Manure per calf, per day	17.23 lbs
Manure per 100 wt. calf, per day	4.8 lbs

Covered yard cleaned Nov. 3d, 1891; again Feb. 6, 1892; interval, 64 days. The yard contained the manure from nine horses, 5 colts, 22 cows, and 31 sheep. There were 63 loads averaging 35 hundred pounds each, or 110¼ tons of manure. Besides this 15 loads of cow manure estimated to average 25 hundred pounds had been drawn directly to the field.

Value per ton of manure produced by various classes of animals, being the average of several determinations:

Horses	$ 2.79
Cows	2.27
Sheep	4.19
Swine	17.11

Value per thousand pounds of live weight of animal per year, nitrogen, potash and phosphoric acid, computed at commercial values:

Horses, $19.12 ÷ 3	$ 6.37
Cows, $29.82 ÷ 3	9.94
Sheep, $38.55 ÷ 3	12.85
Swine, $17.11 ÷ 3	5.70

All of the above results are from our own investigations, in recent years.

Since these animals are in their stables but seven months of the year, and since potash, nitrogen, and phosphoric acid are not worth so much in farm manures as in high grade commercial fertilizers, because they are less soluble, and on the other hand making some allowance for the manurial value of bedding used by the animals, may we not fairly conclude that, if the values given are divided by three, the results reached will represent with a fair degree of accuracy, the true value of the manure produced by a thousand weight of animal of the various classes named.

In any case, it is clear that there is enough value to induce every thinking farmer to see to it that little of this valuable refuse material is wasted.

Four horses of 1,000 pounds each, 20 cows of 800 pounds each 50 sheep of 100 pounds each, and 10 pigs of 75 pounds each, would produce, according to the above modified computation, fertility worth $253, in seven months. It will be seen that after making liberal allowance for lack of perfect solubility in the manure and for losses, that the value still left to be cared for and utilized, represents no mean sum.

Does manure waste, as ordinarily kept in open yards? Each inch of rainfall means that a hundred tons of water have fallen upon each acre of land, and thirty-two inches of rainfall means 3,200 tons of water per acre. A barn yard which requires six sixteen-foot panels on one side and seven like panels on the other side, to enclose it, contains almost an exact quarter of an acre. Then, where there is an annual rainfall of thirty-two inches, such a barn yard, which is smaller than the average one would receive each year 800 tons of water. With such a deluge the only wonder is that there is any value whatever left to manure scattered thinly over these poverty-producing open receptacles for manure. I would as soon think of leaving the hay

out in the open field all winter, as the manure in the open barn yard. What becomes of the 800 tons of water which falls annually upon the quarter-acre barn yard, you can guess as well as I. The leachings from manure about one foot deep, in our tticrlgroee, cat pen showed that each ton of water that had passed through the manure, carried with it sixty cents worth of plant food. Two years ago, 3,319 pounds of horse excrements mixed with 681 pounds of cut straw bedding, making a total of 4,000 pounds, was exposed in a pile about two feet deep, from April to September. When the manure was put in the pile, it was valued at $2.80 a ton; at the end of the six months it showed a value of $1.06 a ton; a loss of 62 per cent. What might the loss have been had this manure been scattered over a large area by scratching hens, rooted over by numerous pigs, and punched into the mud by the hoofs of horses and cattle, and exposed during the six months from September till April, when nearly two-thirds of the annual rain falls, not even the director of an experiment station can have the slightest conception. A similar experiment with horse manure in 1889, showed a loss of forty-two per cent.

In 1890, 9,278 pounds of excrements from the cow stable, mixed with 300 pounds of plaster and 422 pounds of wheat straw, total 10,000 pounds, exposed for six months, from April to September, in a pile averaging nearly two feet deep, lost according to chemical analysis 30 per cent. of its manurial value. In all of these experiments it must be remembered that the per cent. of loss given, does in no way express the true loss, for that which is washed out or escapes in any way from the manure heap, is the most soluble part of the manure and is usually worth as much as the same elements are when found in commercial fertilizers; it is the plant food which is slowly soluble that is left behind and so I believe that it is no uncommon thing to find farm manures which have been exposed to the rain and drippings of the eaves of the barn for five or six months, so fully robbed of the soluble parts of their constituents as to be worth less than a quarter of their real value when thrown out of the stable window.

How may we best prevent these great losses? First, by draw-

ing from the stable directly to the field when the conditions are suitable, all of the stalbe manures as made, up to about March, when the ground is usually too wet to admit of passing over it with teams. Second, by providing suitable receptacles for temporarily storing all manures which are produced at any time of the year, when it is neither suitable, profitable nor best to carry them directly upon the land.

The basement story of a barn, especially if it is well in the ground, may be used to advantage for storing manure, providing the story is high enough. A perfectly tight floor can be constructed cheaply and easily, so that the animals can be stabled on the second floor. The manure will then be dropped immediately beneath the stable with the least possible labor; this is an admirable system, where bedding is not abundant. The cows can be made more comfortable in an upper story, if the walls are lined with boards and the space between the outside and inside boarding filled wiht straw, than they can be in a basement surrounded by a stone wall. A second plan is to add a cheap structure adjoining the stable, or use instead a part of the basement and then transport the manures from the stable to these covered yards on a wheelbarrow. This arrangement implies that there is plenty of bedding, and that the manure from the cow stables and horse stables is to be taken to the common receptacle, and that the animals are to run upon the manure during the larger part of the day. This, of course, is the ideal method where absorbants are abundant.

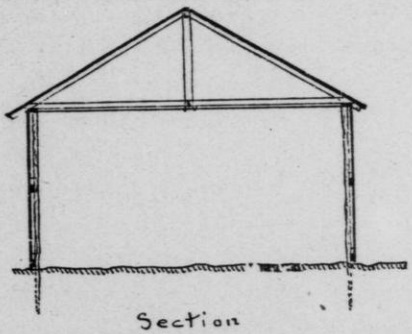
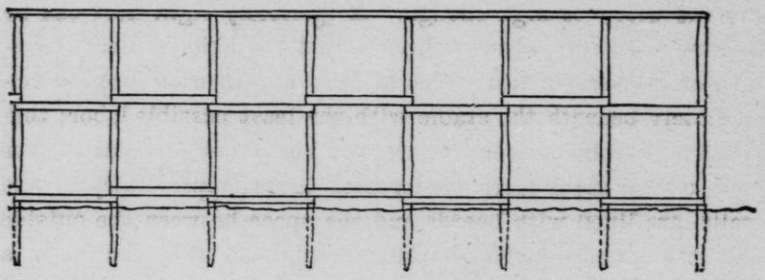


Fig. 1.

Figures 1 and 2 show a cheap method of constructing the frame work of a covered barn yard. The posts are composed

of round poles, set in the ground, which may be sawed off and supported by a stone placed under each one whenever the posts rot off. Girts roughly nailed upon the posts serve to hold the outside vertical boarding. The inside boarding, which may be of the cheapest material, is put on horizontally, and the spaces, between the posts, which are six feet, are filled with straw and chaff. This makes not only a wall that excludes the air, but one that is very dry and free from the chilling sensation which is so often observed in stone basements in cold weather.



Side View of Frame, without roof rafters

Fig. 2.

Where the buildings are already complete, and where no provision has been made for storing the manures, a most excellent plan is to dig a little way into the ground, in order to prevent much freezing, and over this to erect a simple "leanto," not more than six feet wide. All of the floors (see fig. 3) where manures are to be kept, should be treated to a coat of good cement, so that they will be water tight. I find few people are able to make a cement floor that will stand; it is a very simple affair, and as there is a great demand for floors that are durable and cheap, I desire to give some brief explanations and rules for constructing them. First, a solid foundation of from two to six inches thick, of durable broken material, as stone or brick bats. Second, a removal of the water from underneath the floor, wherever it is present, so that the foundation may be solid. Water lime is calcined stone containing a considerable amount of lime and 20 to 40 per cent. of impurities. That is, impurities considered from a standard of pure lime. These impurities are largely silica and aluminum; by heating or burn-

ing these impure lime stones, we get a mixture of lime and silicates of lime; if the impurities in the lime stone run between 40 and 60 per cent., then the product is termed cement; both of these products are made from natural stone, calcined and finely ground. The best grinding reduces them so that they will readily pass through a sieve of 250 meshes to the square inch. Much Portland cement is imported and is an artificial product, made almost entirely of a mixture of clay and chalk in variable proportions; this mixture is usually ground and burned and re-ground. The value of all cements and water lime de-

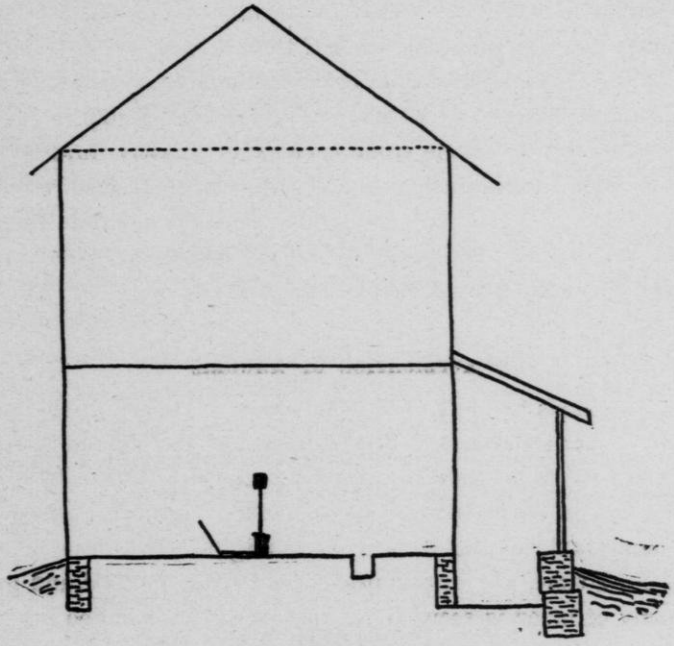


Fig. 3.

pends quite largely on their fineness. Almost any of these water limes or cements mixed in the proportion of two parts of sand to one of the other material, when in a dry state, and then slightly moistened, that is, only just enough water used to make it possible to spread and trowel down, makes a superior mortar. This cement mortar should always be put on a damp surface, and the cementing should be kept damp by sprinkling it with water, or by covering it with a damp cloth until it is

thoroughly hard. Such floors should not be used in any way, for at least a month after they have been constructed. The directions I have given will insure a first-class floor, hard enough to resist perfectly all reasonable wear and tear, and is adapted to the construction of dairy house and cellar floors. A greater amount of sand, say three parts of cne to one of water lime ,or four of sand to one of cement, may be used for the floor of manure cellars. Sand, unless it is very clean, should be thoroughly washed if a really perfect job is desired. The first coat that is applied to the rubble, and which should fill all the interstices between the broken material, should be thoroughly pounded and left somewhat rough, that is, without any smoothing of the trowel; the second coat should be troweled down hard and should not be put on until the first coat is dry, or nearly so. Most mortar made from cement is greatly injured and sometimes ruined by using two or three times as much water as is necessary. It should always be remembered that the less water the mortar contains, up to the point where it can be spread out with some difficulty, the better.

APPLICATION OF MANURE.

Two methods are left open from which to choose in the application of barn manures. First, they may be spread directly from the stable in their raw or undecomposed state. If spread in the fall or early winter, such manures usually form a very beneficial mulch; the losses which might occur from holding them for a time, are largely prevented by this method and great economy of labor is secured, as the manure is handled but once and the labor of doing it is performed in the winter when it costs the lest. But these raw manures act slowly, and hence the plant food they contain is not so valuable as that in well rotted manures; but the danger of loss is so great, even if kept for a year in deep, well snugged up piles, that it is aways advisabe to draw direct from the stable to the field, if there is grass and to spread it upon ,and the ground is not covered too deeply with snow, and is in a suitable condition to put it upon. Usually the manure harvest begins by the last of October to the first of November; from this time on to the first of January,

the fields are usually in a good condition to receive the raw manure from day to day as it is made; but, from about New Year's day on, the difficulties begin to multiply, and then too, manures spread in the late fall or early winter months, give far better results than those spread in the latter part of winter and early part of spring. Usually there is no good place or suitable time to spread manure during the months of April, May, June, July and August. Much maunure should be accumulating at the barn during these months; all this should be carefully protected from waste and should be improved in quality by further decomposition. Overhauling and aerating the manure piles will hasten decay and improve the quality of the manure, and increase its activity, without resulting in serious loss. By holding a part of the manure through the summer months and by improving its quailty and by making the plant food which it contains more soluble, we have secured great economy in several directions. Then this well rotted and carefully preserved manure may be spread on the surface in the fall, where there s a plant growing, thereby following literally the example set us by nature.

If we assume an average yield per acre, and that a five year rotation has been practiced, that is, the land has borne two crops of grass and three of grain, and if we assume that this cropping has been carried on for fifty years, it will be found that over $400 worth of plant food, computed at commercial prices, has been taken from each acre of land. How much of this plant food is in an average case carried back to the field after it has once been conveyed to the barn, you can estimate as well as I. How long you can go on transporting yearly, the plant food of the farm to the barn without returning to the field more than one-eighth of the fertility removed form it, you may be able to guess; if you do not succeed in solving the question, your children without doubt will.

DISCUSSION.

Mr. Gilbert—Would you advise farmers to draw out their manure and put it into small piles as we have down between here and Chicago?

Prof. Roberts — No, by all means spread it upon the ground in the fall, on the surface. I would just as soon pour in a half bushel of oats into my horses' manger and then go in next spring and see if I could find it.

Mr. Fargo — How thick do you want your cement floor?

Prof. Roberts — About six inches level. The trouble is you are so liable to get poor cement and poor sand and then you load it with water. The dryest possible mixture you can get in there is the best; that which is laid by strong elbow action, laid and spread. That will stick. Manure spread in the fall or early winter gives so much better results than that spread late in the year. I think that manure spread in October, November and December will make your ground yield fifteen to twenty bushels of shelled corn more than the same manure spread on the land later.

The Chairman — Prof. Roberts says he asks you to stop and think. If he can make you do that, and the rest of our farmers who are not here, he will make millions of dollars for our state. This question has come to me with wonderful force. I don't know that I have felt so sober over anything as so know the progress of waste all over this county and state. Go into my own little town in New York that I left thirty-four years ago. I have seen the day when those farms could be sold for $100 an acre, to-day they go begging at twenty to forty. What is the matter? I will tell you. Those men have just completely stripped those noble old hill sides of fertility; they have been land robbers, every man of them, and now they are turning over the old oranges with the juice all sucked out of them to the state and claiming that they have been A No. 1 good citizens. The man who will rob the soil is not a citizen, he is a robber. A man who deliberately depletes the power of the state has not learned the first lesson of good citizneship, and to be a farmer, it means to be broad and strong and wide, not a robber of he state. To go down over those abandoned farms in Vermont and New Hampshire and Connecticut and to see the pathetic look of those old houses, when you think of the old happy homes that were there and the boys and the girls who have gone out of there—you think of these things, and think that

same dry rot is coming westward every day, it is bound to smite Wisconsin and smite its fertility if the Wisconsin farmers do not wake up.

Prof. Roberts has come here as a missionary to preach the gospel according to the Lord under the law of fertility that may be put into the soil here.

Prof. Henry — I trust that most of our farmers will heed Prof. Roberts' words. Now, I know that many a farmer asks the question when he hears an address like that, 'Well, what sort of a man is he at home? We want to know whether he practices what he preaches, and Prof. Roberts is quite a way from home, and some of you may go home and say, "That is very nice for an eastern professor to come out here and talk science to us, out it don't go; what do we know about him?" Prof. Roberts was an Iowa farmer when he was called east to take the superintendency of the farm at Cornell university. That farm was one of the meanest God ever made, naturally. He took it and has held his place for fifteen years among a faculty of nearly one-hundred men, and his farm is a model of productiveness, considering its natural soil. Now, he has gone further than that, and is the owner, or part owner, of a farm in Mississippi, where they are feeding a thousand steers this winter. He is a farmer who works just as you are working on your farms. He is not a man who has some theories and has come to work them off on you; his crops have been very heavy, grain from 60 to 80 bushels, and his Mississippi farm is increasing in value every day.

Mr. Gilbert — I wish that every farmer could visit Prof. Roberts and see what he has done with the farm he has. Two years ago I saw two fields of wheat, one which had been under Prof. Robrts' care, and another a neighboring field; the latter produced about fifteen bushels per acre, while the one under Prof. Roberts would run about fifty. And that not only applies to the wheat fields, but to every acre on the farm. It applies also to his cows; he can show you a herd of cows there that are making money on his farm. His cows will earn from $100 to $150 each, and it is just done with brains.

Mr. Morrison — May of the farmers in this audience have

listened to Theodore Lewis, who has been engaged in the institute work for several years. Theodore Lewis lives upon a very sandy farm up in Dunn county, but by keeping hogs and sowing lots of red clover seed, he has gotten up the fertility of his farm to a very high state. This last fall Mr. Lewis was invited to go down into the state of Massachusetts and also into the state of New York and attend a few institutes. He returned and he came up to visit Prof. Henry and myself, and he spent about half a day with us, and we enjoyed the visit very much. He says, "I come back to Wisconsin thinking more of it than I ever did before and I think more of conserving the fertility than ever I did before." Says he, "I would like to go around this satate and do some missionary work. I have talked at different institutes about fertiilty, but I think more of it than I ever did before, because the great cry at the east was, 'Fertility, Fertility.' Upon every side hill I saw abandoned farms and the cry was about commercial fertilizers." And his wish was again to engage in institute work in this state and talk to the farmers about saving the fertility and increasing it upon their farms.

Prof. Roberts —You may not all know that Prof. Henry was a student at Cornell university and that I was one of the professors years ago. You all know, I presume, that Mr. Gilbert is a New Yorker, although he doesn't live very close to me. I thank them very much for their kind words. I want to say to you that the difficulties have been very, great, but the light is just beyond if he will farm according to law, and use the great principles that lie there. I should feel as if Prof. Henry had done well if he had never done anything else in this world than calling your attention to that bran business. When he came to this state it was utterly ignored, with mills all over this country, piled to the roof with bran, selling for five and six dollars a ton.

Now, Prof. Henry has told you the value. I have told you the quantity and the quality of the waste. I have piled up the facts for you and you have got to apply them. Why not raise some of the potash on your farm. Nitrogen will grow on your farm if you get things just right, just as rapidly and as nicely

as a calf or a pig. Clover roots will raise potash and phosphoric acid from the sub-soil a good deal easier than you can raise it from the railway station by signing a note to pay for it. I don't know that that hits here. Our banks are piled up with farmers' notes given for phosphtaes.

Mr. Favill — Our notes are for machinery.

Prof. Henry — The eastern farmers have to pay for the machinery and the phosphates too.

Prof. Roberts —You will have to buy phosphates, and don't you forget it. I am reclaiming the old homestead on which I was born. Last year I struck down in my pocket, and it is in the bank to-day, 200 clean golden dollars for the wheat and straw from 12½ acres on what was the poorest field of the old homestead. Keep before your minds always the fact that before long you have got to buy fertilizers if you don't repent and turn from your evil ways, and select and buy good food which shall have the same properties in it for your cattle. We have analyzed the plant feed in an acre of clover roots and found from 80 to 100 pounds where the clover was real good. Then, remember culture, and you have the three great elements; the manure containing large fertilizing value, clover and culture. I believe that the best farmers that ever were born were born in the United States and are farming here to-day. I can take you to a farm where the man has cleared $8,000 a year in New York state, and yet so many of these men wont wake up. I come here because I want to help wake you up to see things before it is everlastingly too late. We bought 1,160 acres of land for $2.00 an acre in the state of Mississippi that sold about forty years ago for $45 an acre. The man who sold us that farm got $1.50 an acre for the land, and the lawyer that did the business got a half dollar an acre. We have improved it by feeding animals simply and it is worth to-day fifteen and twenty dollars an acre. I bought 650 acres more that I paid $6 an acre for, and I have 200 head of cattle on that piece. I bought cotton seed meal at $3.00 a ton to feed, and I am bringing that land up. Now, I beg of you, don't just jump up and go home and do the same thing over again that you have been doing. The hardest thing we can do is to

think. We can all use our muscles and are willing to do it in good hard work; but thinking, and only thinking, will be our salvation. I beg of you to go home and study up the laws that govern this universe, and say to yourself, "I will know something more of them, and I will make them serve me."

The Chairman: Is there any further business to come before this convention? If not, I desire, on behalf of the Wisconsin Dairymen's Association, to extend their thanks to the farmers of Winnebago County, for the great interest, the splendid attendance that they have given the deliberations of this meeting. I desire personally, to thank you all for the kind forbearance and excellent assistance I have received at your hands, as your presiding officer, and I now declare this convention stands adjourned sine die.