Ninth annual report of the Wisconsin Dairymen's Association : held at Waukesha, Wis., January 12-14, 1881. Report of the proceedings, annual address of the president, and interesting essays relating t...

Wisconsin Dairymen's Association
Madison, Wis.: David Atwood, State Printer, 1881

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NINTH ANNUAL REPORT

OF THE

WISCONSIN

DAIRYMEN'S ASSOCIATION,

HELD AT

WAUKESHA, WIS., JANUARY 12–14, 1881.

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

COMPILED BY D. W. CURTIS, SECRETARY.

MADISON, WIS.:
DAVID ATWOOD, STATE PRINTER.
1881.

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OFFICERS, 1881.

PRESIDENT,

C. R. BEACH,

WHITEWATER, WALWORTH CO.

VICE PRESIDENTS,

CHESTER HAZEN, LADOGA, FOND DU LAC CO.,

President Wisconsin Dairymen's Association from 1872-4.

HIRAM SMITH, SHEBOYGAN FALLS, SHEBOYGAN CO.,

President Wisconsin Dairymen's Association from 1875-6.

A. D. DELAND, SHEBOYGAN FALLS, SHEBOYGAN CO.,

President Wisconsin Dairymen's Association, 1877.

H. F. DOUSMAN, WATERVILLE, WAUKESHA CO.,

President Wisconsin Dairymen's Association, 1878.

Z. G. SIMMONS, KENOSHA, KENOSHA CO.,

President Wisconsin Dairymen's Association, 1879.

STEPHEN FAVILL, DELAVAN, WALWORTH CO.,

President Wisconsin Dairymen's Association, 1880.

SECRETARY,

D. W. CURTIS,

FORT ATKINSON, JEFFERSON CO.

TREASURER,

O. P. CLINTON,

WAUKESHA, WAUKESHA CO.

ARTICLES OF ASSOCIATION.

[*Adopted February* 15, 1872.]

ART. I. The name of this organization shall be, the Wisconsin Dairymen's Association.

ART. II. The officers of the association shall consist of a president, two vice presidents, and a secretary and treasurer.

ART. III. The president, vice president, secretary and treasurer shall constitute the executive board of the association.

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

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

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

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

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

ART. IX. 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 1881.

A.

Adamson, Edward, Waukesha, Wis.
Ayer H. M., Lodi.
Aitkin, Elvin, Waukesha.
Austin, Henry, Lancaster.

B.

Blair, Geo. B., Waukesha.
Barker, L., Brookfield Centre.
Brobst, Dan., Pedee, Green Co.
Baltz Peter, S. Water St., Chicago, Ill.
Bray, John, Darlington.
Baache, Gustav, Waterville.
Breeze, Sam, Waukesha.
Bacon, W. D., Waukesha.
Beaumont, Eph., Hartland.
Beach, C. R., Whitewater.
Boyd, John, 199 Lake St, Chicago.
Blackwell, Geo., Waukesha.
Brown, C. B., Oconomowoc.
Beneke, Ernest, Brookfield Centre.
Billet, Geo, Whitewater.
Bamford, H. J., Plymouth.
Barker, R. H., Waukesha.
Bannon, P., Waukesha.
Blodgett, W. R., Waukesha.

C.

Curtis, D. W., Ft. Atkinson.
Clinton, O. P., Waukesha.
Cole, Norman, Brodhead.
Cole, Norman, Mrs., Brodhead.
Conger, H. A., Whitewater.
Crossfield, F. O., Ft. Atkinson.
Crossfield, C P Ft. Atkinson.
Chafin, E. W., Waukesha.
Cook, Joseph. Duplainville.
Child, H. H., Clinton Junction.
Culver, O., Waukesha.
Cummings, H. B., North Prairie.
Carswell, N., Elkhorn.
Cook, James O., Waukesha.
Cowles, J. A., Elkhorn.
Coleman L, Waukesha.
Cork C., Waukesha.
Cahill, M., Waukesha.

D.

Dey, A. V. B., Waukesha.
Davis, James, Waukesha.
Duncan, J. B, Baraboo.
Davis & Fairlamb, 170 Lake St., Chi.
Dousman, H. F., Chicago.

E.

Enos, E., Waukesha.
Estberg, C A, Waukesha.
Edmunds, Wm., Waukesha.
Edwards, I. J., Juneau.

F.

Fox, S. A., Waukesha.
Faville A. D., Lake Mills.
Favill, Stephen, Delavan.
Fargo, F. B., Lake Mills.
Frazier, U., Vernon.
Fairlamb, C. C., 170 Lake St., Chi.
Frame, A. J., Waukesha.
Frame, H. M., Waukesha.

G.

Gale, Isaac, Waukesha.
Griswold, J. A., Duplainville.
Gerber, Nicholas, New Glarus, Green County.
Goodwin, David, Waukesha.
Gilbert, A. E., Prospect Hill.
Griswold, M. S., Waukesha.
Gernon, Stephen, Waukesha.
Greene, W. S., Milford.

H.

Harland, Wm., Duplainville.
Hughes, H. S., Waukesha.
Hinckley, B. R., Oconomowoc.
Hazen, Chester, Brandon.
Howard, John, Waupun.
Holden, B., Sheboygan Falls.
Hoyt, Frank E., Rochester.
Hardell, George, Fort Atkinson.
Haylotte, Horace, Menomonee Falls.
Hoard, W. D., Fort Atkinson.
Howitt, John, Waukesha.
Holbrook, W. C., Waukesha.
Hodgson, M. S., Waukesha.
Hadfield, J. J., Waukesha.
Hammersley, W. H., Geneva.
Henry, Prof. W. A. Madison.

I.

Ingalls, E. P., Milford.

J.

Jones, Morgan, Waukesha.
Jackson, C., Waukesha.
Jones, Geo. R., Waukesha.
Jones, Wm. C., Waukesha.
James, S. D., Waukesha.
Johnson, David, Waukesha.
Jenkins, E. W., Waukesha.
Jones, Carmadock, Waukesha.
Johnson, Joseph, Hartland.

K.

Koch, Jr., Wm., Plymouth.

L.

Le Fevre, W., Eagle.
Love, J. C., Waukesha.
Loomis, H. K., Sheboygan Falls.
Lawrence, George, Waukesha.
Longley, D., Dousman Postoffice.
Love, George A., Waukesha.
Lapham, Henry, Oconomowoc.
Lockin, J. W, Fond du Lac.
Luchsinger, John, Monroe.

M.

Millard, C. J., Lake Mills.
Montgomery, E., Greenbush.
Mucklestone, Allen, Waukesha.
McCutcheon, R. F., Whitewater.
McVicar, John, Waukesha.
Marshall, A. G., Waukesha.
Miller, Prof. A. A., Waukesha.

N.

Nelson, T. H., Genesee.
Newell, Jas. A., Whitewater.
Nickell, Wm. A, Waukesha.
Newall, Dan, Waukesha.
North, Prof. A. F., Pewaukee.

O.

Olin, O. Z., Waukesha.
Olin, Q C., Oakland.

P.

Putney, A. S., Waukesha.
Putney H. O., Waukesha.
Payne, James, Cove, Oregon (state).
Passoldt, C., Waukesha.
Paul, J. H., Genesee.
Peffer, Geo. P., Pewaukee.
Patton, A., Elkhorn.
Prosens, Hiram, Oconomowoc.
Porter, Ed., Waukesha.
Price, David D., Waukesha.
Pardee, A. J., Eagle.
Porter, John, Waukesha.

R.

Rickmeir, S. A., Plymouth.
Reiniking, F. C., Franklin, Sheboygan county.
Reik, J. A., Hartford
Roberts, J. D., Waukesha.
Russell, John, Waukesha.
Rhodes, Hiram, Duplainville.
Rhodes, J. H., Pewaukee.
Ryall, Thos., Waukesha.
Rockwood, Prof. S. S., Whitewater.

S.

Steele, Jr., Thos., Genesee.
Suhrke, F., Plymouth.
Seward, M. N, Harvey.
Stowe, W. D., Whitewater.
Seward, J. G., Harvey.
Sherman, J. N., Delavan.
Shultis, N., Waukesha.
Shultis, Frank, Waukesha.
Swallow, H., Hartland.
Smith, J. A., Belgium.
Sheldon, E. E, Fort Atkinson.
Stuart, James, Vernon.

Smith, Hiram, Sheboygan Falls.
Strong, I. N., Sheboygan Falls.
Sheets, John, Waukesha.
Sumner, D. H., Waukesha.
Sherman, H. D., Monticello, Iowa.

T.

Thomas, J. E., Sheboygan Falls.
Tichenor, O., Waukesha.
Tenney, S. A., Durham Hill.
Tyler & Bugbee, Waukesha.

U.

Utt, G. D., Lancaster.

V.

Vincent, G. H.

W.

Willard, Prof., X. A., Little Falls, N. Y.
Wilkins, Joseph, Waukesha.
Wolfe, O. L., Auroraville.
Wheaton, A. H., Auroraville.
Wagner, John, Waukesha,
Williams, Joseph, Waukesha.
Wilkinson, H. J., Whitewater.
White, I. M., Waukesha.
Wallace, J., Algona, Iowa.
Williams, H., Waukesha.
Waite, J. A., Waukesha.
Wheeler, Frank Waukesha.
Wilson Samuel, Oregon, Ill.
White, R S & Co., Fort Atkinson.

Y.

Youmans, H. M., Waukesha.

NINTH ANNUAL MEETING.

Waukesha, January 12, 13 & 14, 1881.

PROGRAMME.

WEDNESDAY, 9 O'CLOCK A. M.

Entry and Classification of Butter, Cheese and articles for exhibition.

EVENING SESSION, 7 O'CLOCK P. M.

Organization of Convention.

1. Address of Welcome, by H. M. Youmans, Esq., president of the village.
2. Response, by C. R. Beach, Esq., Whitewater.
3. Opening Address, by President Favill.
4. Appointment of Committees.
5. Report of Secretary and Treasurer.
6. Mixed Farming (as generally understood and practiced) a Snare and a Delusion, by Hon. Hiram Smith, Sheboygan Falls.
7. Winter Dairying; or, The "Ins and Outs" of Butter Making in Winter, by George Lawrence, Waukesha.
8. Systematic Feeding in the Dairy, by Prof. W. A. Henry, State University, Madison.
9. Address by Hon. X. A. Willard, Little Falls, N. Y.
10. Address by H. D. Sherman, Esq., president Iowa Dairymen's Association, Monticello, Iowa.
11. Report and Awards of Committee on Butter and Cheese.
12. Familiar Talk on Dairy Topics, by W. D. Hoard, president Northwestern Dairymen's Association, Fort Atkinson.
13. The Co-operation of Milk Producers and Manufacturers of Butter and Cheese as practiced in Wisconsin, by Chester Hazen, Brandon.
14. Manufacture of Swiss Cheese in Wisconsin, by Hon. John Luchsinger, Monroe.
15. Report of President Favill in regard to experiments made by the Association during the season of 1880, in the keeping qualities of Butter and Cheese.
16. Can Wisconsin Dairymen do Better than by Making Full Cream Cheese? by H. F. Dousman, Oconomowoc.

The Convention will discuss various topics not down on the programme, among them "Sweet and Sour Curd," "Proper Time to Cut Hay," "Ensilage," "Adulteration of Butter," etc.

All persons whose names appear in the above programme have written that they will attend the convention.

THURSDAY EVENING.

Dairy Banquet and Sociable.

Poem by Prof. S. S. Rockwood, Whitewater.

DAIRY FAIR.

Premiums offered on Wisconsin Butter and Cheese, Dairy Utensils, etc., To be exhibited during the Convention.

CLASS I.

PREMIUMS ON CHEDDAR CHEESE.

$50.00 with entrance fee of fifty cents for each entry added.

The association offers a premium of $50 00 with entry fees added, to be divided among exhibitors in proportion to the number of points obtained by each, whose exhibit shall be awarded 44 points or over, on a scale of 50 points.

One cheese manufactured at any time, of not less than 40 pounds, constitutes an entry.

CLASS II.

FANCY SHAPED CHEESE.

Best exhibition of			"Young America Cheese"	$5 00
"	"	"	Goudas	5 00
"	"	"	Champions	5 00
"	"	"	Edams	5 00

CLASS III.

BY GEO. S. HART & HOWELL, *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 made cheese.

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

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

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

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

CLASS IV.

PREMIUM ON BUTTER.

$50.00 with entrance fee of fifty cents for each entry added.

The association offers a premium of $50.00 with entry fees added, to be divided among exhibitors in proportion to the number of points obtained by each, whose exhibit shall be awarded forty-four points or over, on a scale of fifty points.

CLASS V.

PRINT BUTTER.

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

CLASS VI.

GRANULATED BUTTER.

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

Granulated butter may be exhibited in fruit cans.

CLASS VII.

COUNTY EXHIBITION.

For the best and largest exhibition of dairy products from one county	$20 00

CLASS VIII.

For the best display of apparatus for making cheese	$10 00

CLASS IX.

BUTTER MAKING.

For the best display of butter-making utensils	$10 00

CLASS X.

CREAM RAISING.

For the best display of apparatus for raising cream	$5 00

CLASS XI.

BUTTER COLOR.

For the best display of butter color	$3 00

CLASS XII.

BUTTER PACKAGES.

For the best package for shipping packed butter	$3 00

CLASS XIII.

For the best package for shipping print butter	$5 00

CLASS XIV.

PRESS OR MOULDS.

For the best press or moulds for marking print butter..... ..... $2.00

Cheese, butter and articles for exhibition may be sent by express, charges prepaid, to O P. Clinton, Waukesha, who will place them on exhibition, and dispose of them, if requested, after the convention is over, and remit the proceeds.

Mark all packages with your own name and address, so that they may be identified.

Butter and cheese, and all articles must be on hand so as to be placed on exhibition by 9 A. M. on the 12th, as the committee will make their examination in the afternoon.

The association purchased during the months of June, July and August, twenty-four cheese and five tubs of butter in different parts of the state all made differently, and each one supposed to represent the best way known for making full cream cheese, or gilt edged butter.

Part of the cheese has been kept in a good curing room, and the balance with the butter in cold storage.

It will be placed upon exhibition, and a full report made upon its keeping qualities, the different modes of manufacture, etc.

RULES GOVERNING THE EXHIBITION.

1. Entrance fee to be fifty cents for each entry except in class VI.

2. Butter made at any time, and to be in packages of not less than twenty pounds, except in classes IV and V.

3. Butter in stone jars not allowed to compete for premiums.

4. No package can compete for more than one premium except in class VII.

5. Scale of points for judging cheese: Flavor, 15; quantity, 15; texture, 10; style, 6; color, 4. Total 50.

6. Scale of points for judging butter: Flavor, 20; grain, 15; salting, 5; color, 5; style of package, 5. Total 50.

Manufacturers, dealers and inventors are invited to make an exhibit of dairy goods in which they are interested. A committee will be appointed to examine and report upon the same.

The hotels and boarding houses of Waukesha agree to board all members of the convention at one dollar per day.

Parties wanting cheese or butter makers for next season, and those wishing situations, will find books for register that the wants of each may be known.

Members paying full fare one way will be returned at one-fifth fare.

STEPHEN FAVILL, *President, Delavan.*
O. P. CLINTON, *Treasurer, Waukesha.*
D. W. CURTIS, *Secretary, Fort Atkinson.*

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

WISCONSIN DAIRYMEN'S ASSOCIATION,

AT THEIR

NINTH ANNUAL CONVENTION,

HELD AT

Waukesha, January 12, 13 *and* 14, 1881.

The Ninth Annual Convention of the Wisconsin Dairymen's Association convened at the opera house in Waukesha, Wednesday, January 12, at 7:30 P. M. President Favill in the chair.

President Favill introduced H. M. Youmans, president of the village, who welcomed the dairymen of Wisconsin to the beautiful village of Waukesha in a most eloquent speech.

Mr. President, and Gentlemen of the Wisconsin Dairymen's Association: On behalf of the citizens of Waukesha, I welcome you within our village, and take pleasure in assuring you that we feel it a pride and an honor to have been selected to act as your hosts during your ninth annual convention. Had your visit been made in the summer time, I feel warranted in saying that a much warmer reception would have been in store for you, yet we recognize the necessities that compel the dairymen to assemble in the sombre days of winter; and it is, perhaps, more appropriate that the matter-of-fact business you have to transact should be performed when the stern winter king is abroad. But, whether you visit us in the ripening summer or the sere winter, a welcoming hand will be

extended. Our people feel that among the good and substantial occupations of mankind, there are very few more worthy than that of causing nature to yield up her wealth in the form of pure articles of food, the securing for these a place in the markets of the country, and the encouraging of honest labor and honest dealing. I take it that these are the purposes that called the Wisconsin Dairymen's Association into being, and how well it has furthered these objects scarcely needs to be told. From the almost insignificant position that our dairy products maintained in the markets of the country a decade ago, they have grown in demand until they enjoy a national reputation — even go across the waters to the old world. And to you, gentlemen, it can be truthfully said that a good share of this development and advancement is due. But for your works, many places that are to-day blooming with the flowers of prosperity would have remained unproductive of wealth.

Even the flourishing county of Waukesha has been affected for the better. Our Olin, and Clinton, and Lawrences, and Dousmans, and Shultis, and Hinckley, and others, have taken an increased zeal for their business by reason of these annual gatherings, comparisons and discussions.

An English philosopher recently said that "discussion is one of the motive powers of mankind," and when looking through the records of this association some time ago, I could not help thinking of how thoroughly Wisconsin dairymen are awake to that fact. You have selected the force which keeps up a forward movement. It is said there is no permanency except the permanency of change. It is always growth or always decay. Your industry is growing and promoting growth. It will so do as long as it has for its motive power healthy, intelligent discussion.

Experience has shown that this and kindred organizations wield a wonderful influence for good. Markets are governed to an appreciable degree by your doings, for it is known full well that here are represented a great number of producers whose labors send locomotives with long trains, whirling across the continent, causing lake and ocean to glisten with sails and to be ploughed by mighty steamers, all hurrying to the great centers of trade laden with valuable cargoes. And in return, there comes back a golden stream that annually enriches our dairymen and their fellow Badgers by countless thousands of dollars.

A few weeks ago a Chicago paper stated that the reason so many imitations of butter are placed in the markets is because there is not a sufficient supply of the genuine article. The writer asserted that increased consumption within three or four years past had outgrown the increase of supply. If this be true, it only indicates a necessity for the kind of work that you, gentlemen, are now encouraging, and which cannot fail to largely aid in making our state among the most wealthy and influential in the Union.

And now permit me to again assure you of the satisfaction we feel at your presence in the Saratoga of the West, and in extending to you the hospitality of our homes. We wish for you a season of profit and pleasure, and may your labors annually insure a Hoard of happiness. Gentlemen, you are welcome.

RESPONSE TO ADDRESS OF WELCOME.

By C. R. BEACH, Whitewater.

Mr. President, Ladies and Gentlemen: Before replying to this welcome, let me say that I shall violate my own sense of propriety in the length to which I shall extend it. But our secretary, Mr. Curtis, wrote me that he should be short of entertainment for the evening, and therefore wanted me to occupy considerable time. To please him, I have, therefore, spread what few thoughts I had over several pages, and of course had to spread them very thin. If, therefore, you find me dry and tedious, pardon me, and place the blame where it belongs — on Curtis' shoulders.

I feel myself highly honored in standing here to-night, as the representative of the Wisconsin Dairymen's Association, and in their behalf to thank the people of Waukesha for their cordial welcome, so freely extended and so happily expressed by your worthy representative and president, Mr. Youmans. And yet I feel a peculiar sense of embarrassment, fearing that I may fail to express this sentiment in terms fitting to this occasion.

The hospitality of Waukesha has become proverbial throughout the state. Almost every town within its limits, through its representative boys, can bear witness to the cordiality of your welcomes — to the motherly, loving embraces with which you clasp them to your bosom, and will not let them go until they have prom-

ised to be superlatively good, and verified that promise by years of most exemplary behavior.

Within your limits bubble up the healing waters of Bethesda — more potent than those old Judean pools, for they need no angel to trouble them — to give them healing power. To these fountains of living waters you extend your welcome to the sick and afflicted throughout the length and breadth of this broad land; be they rich or be they poor, high or low, you say to them, "Come ye, one and all, and partake of this elixir of life freely, *freely*, just so long as you are willing and able to pay liberally for it."

But not such, the welcome you extend to us to-night. It is in no sense narrow, sordid or personal. You recognize in us the representatives of a great industry, which is yearly adding millions to the wealth of the state.

I shall not attempt to give a history of the growth and progress of the dairy interest in this state. I will only say that fifteen years ago it was nowhere recognized as an independent branch of farming. To-day, measured by the amount of capital, labor and skill employed, the value of its products, or the relative profits in proportion to capital, it is entitled to the first rank among our farm industries.

There have been many causes which have had their influence in stimulating the rapid development of the dairy business, but I am sure that none of you will accuse me of presuming too much when I claim that this association, in its collective capacity and through the influence of its individual members, has contributed largely in bringing it to its present high state of prosperity.

The dairy business has had and will continue to have its times of depression, but those who have steadily pursued it have been uniformly successful. To those who are ambitious to be suddenly rich, or to those who seek to acquire property by hazardous ventures, dairying can have but few attractions. But to those who only seek moderate but sure returns as the legitimate price of labor and capital invested, it has much to commend it.

Perhaps there is no branch of business in which one can with more certainty forecast his future probable income. Its permanency is insured by the universal demand for its products, which are in themselves so perishable that no large accumulation can be held to the detriment of that which is being produced. A sudden and ruinous

increase in production is impossible, as cows cannot be made to order on short notice, and in all thickly settled countries the ratio of cattle to population is sadly decreasing. But the sure and uniform returns of dairying are not its only recommendations. When conducted as it ought to be, it improves both the farm and the farmer. The superiority of dairy farming can easily be demonstrated by comparing the people of a community exclusively devoted to it, in point of intelligence, wealth, refinement and morality, with those of one whose leading business is grain growing. The long periods of comparative leisure in winter, broken only by town-going for marketing, leads to habits of idleness, if not dissipation, while the habits of uniform application, method and order, neatness, skill and forethought, so inseparably connected with dairy farming, do much to bring out the better qualities of the man. And the daily knowledge which patrons of the same factory may have of the amount of milk produced by each, stimulates to a generous rivalry to excel, and so leads to better feeding and better care of cows, and so to improvement in all matters pertaining to the dairy and the farm.

And the labors connected with dairying, though constant and unremitting, require no great and powerful strain upon the muscles, but are light and pleasant, alike conducive to health and the highest physical development. As to mental growth, I know that the opinion has been floating round the world from time immemorial that farm life was unfavorable to it. That it might grow big bones and strong muscles, but somehow it deadened and stupefied the mind.

More than two thousand years ago, the son of Sirach wrote: "How can he get wisdom that holdeth the plow and glorieth in the goad, that driveth oxen and is occupied with their labors, and whose talk is of bullocks; he giveth his mind to make furrows, and is diligent to give the cows fodder. But he shall not be sought for in public council, nor sit high in the congregation. He shall not sit in a judge's seat, nor understand the sentence of judgment. He cannot declare judgment and justice, and he shall not be found where parables are spoken; but he will maintain the state of the world, and all his desire is in the work of his farm." But I presume when he wrote that, he had never attended a dairy convention. That was before the world traveled by steam, wrote by lightning, and talked by the telephone.

But whatever may have once been true of farm life in general, modern dairying puts no clog upon the intellect, but rather stimulates it in every conceivable direction. All its operations have their root and are inseparably connected with the most intricate principles of science.

While the dairyman must have a practical knowledge of all the minutest details of his business, he may at the same time push his investigations in science in almost every conceivable direction, and not go out of his legitimate sphere.

The thoughtful dairyman will every day discover his need of that knowledge which is only obtained by scientific investigations, and he who is best able to understand and reduce to practice its teachings will be most successful in his business.

But not only are all the operations connected with dairying favorable to the best development of both the body and the mind, and conducive to a high civilization, but the same is true of its products.

Man is so material in his nature, that not only his physical but his intellectual and moral well-being depends much upon the food which he eats. Milk, butter and cheese occupy a middle ground between the blood-heating, passion-inspiring animal food, and the cool, lymphatic vegetable. I will not attempt to demonstrate that the use of dairy products as food is indispensable to advancement in civilization, but I do claim that their use is conducive to it, and the higher the civilization the greater the demand for them. Good butter is a great civilizer. It is more; it is a means of grace more potent than poor preaching. It oils the domestic machinery and makes it run smoothly, which for the want of it, would grate, and grind and jar.

It is claimed that a beautiful picture, a piece of statuary, or even a vase of flowers, exerts a refining influence in the home; how much more that golden-colored, firm-grained, delicate-flavored plate of butter? If the bread and butter be good, how easy it is to be amiable.

But how many a man who calls himself a Christian, and is so esteemed by his fellow men, has sat at his own table sullen and morose, with frowning brow and scowling lips, casting a cloud of gloom and reserve over all the social circle, all unmindful that his wife opposite had frizzed and banged her hair, and put on personal

adornments with special reference to his approval, and all because the butter was bad.

Robert Owen once said, "give me a man's latitude and longitude, and I will tell you his religious belief." He might have added with equal truth, show me the dairy products which a people consume, and I will tell you their rank in civilization.

We see, then, that this business of dairying touches society at almost every conceivable point. It not only adds to the wealth of the state — the prosperity of those engaged in its production — the advancement of civilization, but it also enters into the economy of every household, it affects the happiness of every individual. They, then, who by their labors cheapen the cost, or improve the quality of the dairy products of a country, may, and ought to be considered public benefactors, and because you look upon us as such, you to-night extend to us this hearty welcome. Associated efforts for the improvement of dairying are but of recent origin, and it is not to be supposed that a business which involves so many questions in science, and in practical scientific knowledge of fundamental principles and practical knowledge of their application, should have reached perfection in a score of years, and I believe that all of us will be willing to admit that what we know of our business is incomparably less than what we have to learn. G. P. Lord, of Elgin, in his remarks before the Northwestern Dairymen's Association last winter, claimed that in the best known methods of making butter or cheese from milk, or both butter and cheese from the same milk, we fail to extract one-half of its nutritive properties. If that be true, we have in that single direction but half learned our trade.

Mr. Darlington, of New York city, has just finished a test trial with his cow, "Eurotas," in which he claims to have produced seven hundred and seventy-eight (778) pounds of butter in eleven months and six days, eight months of which time his cow was in calf.

Did that cow produce that amount of butter from the food she consumed? Did she extract all the butter from the food she ate? Do we, as dairymen, obtain an equal per cent. from the food we give our cows? If not, why not? How much do we waste, and what are the remedies? I have only introduced these few questions to show how much we have to learn.

And we may extend our inquiries in almost any direction with the same results. And our coming here is not to show how much

we know, but we come as scholars and as learners, each striving to gather not only from the success of others, but also from their failures and *our* own, that wisdom we feel we so much need.

And I trust that this meeting will be profitable to us all — that we shall not only gather knowledge that will aid us, but that we shall also be stimulated to practice better what we do know, to love our business better, to feel that it is honorable and worthy of our best efforts.

But you welcome us not alone as dairymen, but you at the same time recognize in us the representatives of labor, for while dairying affords the widest scope for the fullest exercise of the intellect, success in it is only attainable by the labors of the hands. I know that hitherto the world's welcomes, its recognitions, its homages and its triumphs, have been conferred upon those most distinguished as destroyers of life and property, or those who have grasped and wielded power for personal aggrandizement, or those who have succeeded in appropriating an undue share of the world's wealth to their own personal use. But it is beginning to understand that its true benefactors are those who do its work.

And why should not labor be honored? What has it not done for us and for the world? It has opened up our farms, built our pleasant homes, our school houses and our churches, our halls of learning, and our institutions of benevolence. It has constructed our railroads, which, like a vast net-work, cover the land. It has built our ships, whose countless sails whiten every ocean, lake and navigable river, throughout the bounds of civilization.

It clothes and feeds the world. It has brought from the forests and the mines the timber and the iron, the gold and the silver, the coal and the marble, and then it has fashioned them into the thousand forms of utility and of beauty. All that makes our daily life more desirable than that of the rudest savage are its fruits. All our wealth is but its stored up accumulations.

I do not claim that all this which I have named is the result of mere brute force, but rather of the skilled hand, the trained muscle guided and directed by the intellect. I know that none of you will for a moment suppose that I undervalue intellectual effort, but what I would at this time enforce upon you is the *worth* and *value* and *dignity* of physical labor. It is the root, the trunk and the branches, whose blossoms and whose fruitage make our civilization.

How powerless were all the labors of the brain, if the hand and the muscles ceased to do its bidding?

The age is full of inventions; nature has been coaxed and tortured, until she has disclosed and yielded up many of her hidden forces, which have been harnessed and broken, and made subservient to the world's work. Yet in spite of all this, should man cease to put forth physical effort, should the hand refuse to work, the work of the world would stand still.

And the time will never come when the forces of nature can be so arrayed against herself that she will yield up her wealth for the gratification of our desires or the promotion of our comfort, unless we join our strength with hers for its accomplishment.

And even those emanations of intellectual power, which we deem our crown and glory, which prove our kinship to that being who spake and it was done, who commanded and it stood fast, can only be shown in their perfection through the medium of the physical organization which has been developed by physical labor. Sound minds in sound bodies are not the products of idleness and effeminacy. It would seem self evident that physical labor, which is the direct source or is inseparably connected with everything we deem of worth, must be in itself ennobling. I know that the world has long cherished the notion that physical labor carried with it the taint of punishment. That it was incompatible with the highest nobility. That it was the mark of inferiority. That the fiat which declared that from henceforth man should eat bread in the sweat of his face, was a curse to drag him down, rather than a blessing to lift him up, and that he is most favored with God, and deserves to be most honored by man, who is best able to escape from it.

But after all, may there not be some mistake in the record or the interpretation of it?

I have been told that the Hebrew writing was read, not only from left to right, but also from right to left. May it not be this sentence has been read the wrong way, and thus its meaning been perverted?

The probability is that Adam had so long led an easy life, that when forced to work he didn't like it, and so misinterpreted the purport of the decree. The truth is, that if he hadn't first grown lazy, he wouldn't have been wicked.

If labor was designed as punishment for a crime, in the guilt of which we by inheritance share, let us submit to the penalty willingly because we are thus guilty; but if it was designed as a source of blessings, let us prize it and honor it.

But the vice of the world at the present time is not in its idleness. We labor enough, but our necessities compel the most of us to do so. But is it not true that while we fulfill the law of labor in the letter we break it in the spirit? We groan and sigh in our work and long to escape from it. We doff our hats and *bow low* to those who have emancipated themselves from it, even though they have secured the means to do so by fraud and dishonesty; while we pass him coldly by without recognition, whose sweat and toil have produced the wealth of the idler whom we honor. We blush and hang our heads to be seen clothed in our soiled and labor-stained garments, as though they were marks of degradation rather than the badges of true manhood. By pursuing such a course, do we not dishonor that which we acknowledge to be the source of our highest blessing? This state of things is in part a heritage of the past, and in part the result of our present defective methods of education.

The tendency of our higher institutions of learning is to educate away from physical labor, rather than to infuse through it that strength and power which comes from intellectual training. May not our sons be so educated that they shall look upon the farm and the work-shop as affording as wide fields for effort, as as sure roads to preferment, as the lawyer's office or the pulpit; and our daughters so that they shall consider the skillful ordering of a household, or the preparing of a dinner, as affording as sure indications of intellectual superiority as the thumping of a piano.

May they not be so taught that they shall look upon those soft, white hands which they now prize so highly, so weak and effeminate that a lover must not put all his ardor into his hand-shaking, lest he crush them, as less indicative of true refinement, than are those trained hands, so strong to do and so swift to minister to the wants of the loved and the needy; and that only by uniting physical labor with intellectual training, may they hope to attain to that perfection of womanhood that shall make them helpful wives of noble men, and honored mothers of stalwart sons.

While we realize and claim that there is much which is wrong in society, that so long as one man may appropriate a hundred million

of dollars of the world's wealth to his own private use, not only legally, but at the same time receive the world's homage and world's worship for so doing, labor cannot receive the full measure of its reward or be duly honored, yet the signs of the times are hopeful, and the world is moving on in the right direction. Never in the world's history would the price of a day's labor purchase sc much of the comforts and the luxuries of life as to-day. Never before was capital so willing to yield to labor so large a share of their united products, never was labor so thoroughly awake to understand its rights and to maintain them. Even in oppressed and downtrodden Ireland, where for ages labor has been shorn of its strength, it has grappled with its oppressors in a hand to hand encounter, and in the end will come off victorious.

Associations are everywhere springing up, having for their object a better understanding and a wider diffusion of the principles of social science, of political economy, of the relations of labor to capital, and the duties of government both to capital and to labor, the rights of society and the rights of humanity. All these questions are being pondered and discussed; and understood not alone by the professional scholar and the scholarly thinker, but also by those whose labor has produced and is producing the world's wealth. And a universal tendency is towards a better understanding and a juster appreciation of the rights of all, a larger charity and a more universal brotherhood.

Our business as dairymen calls us to physical labor. Let us honor it by uniting with it our highest and best intellectual efforts, and then let us diffuse through both the spirit of universal benevolence. Thus equipped, let us go forth to do our part in the world's work. Let us join our efforts with all those, who with hand or brain, are striving to lift the world towards that ideal state which the good in all ages have longed for and labored for.

"Then let us pray that come it may
As come it will for a' that,
When sense an' worth through all the earth
May bear the gree for a' that,
For a' that, and a' that,
'Tis coming yet for a' that,
When man to man the world o'er,
Shall brother be for a' that."

Let me, then, in behalf of this association again thank you for your sincere and hearty welcome. For by this mutual hand clasping we not only recognize the universal brotherhood of all true workers, but we at the same time vindicate the nobility of labor.

OPENING ADDRESS.

BY STEPHEN FAVILL, DELAVAN, PRESIDENT OF THE ASSOCIATION.

Mr. President, Ladies and Gentlemen: In obedience to the commands of our executive committee and in accordance with our time honored custom, I come before you at this time to say a few words by way of a send-off to the doings of this convention.

At first, I felt disposed to rebel against the orders of my compeers in the matter. The reason for my feeling mutinous was, that I did not know what to talk about. The dairy topics have so often been presented in both essay and address, and more than that, the members of this association have so much practical knowledge of the dairy business, that I felt myself entirely incompetent to instruct or interest you. But having said both privately and in public that no member of an association had the right to say "I won't" when his associates said he ought to do a certain thing, I am here to say my say, and to do what I can to help to make this meeting one of interest and profit. I do not expect to tell you anything new; but if I succeed in awakening careful consideration of old truths I shall be satisfied.

Coming before you for the reason already given, I am very glad I am able to do so under so favorable circumstances. The cordial welcome given us by the good people of this city (through their president) gives us assurance that they are fully in sympathy with and properly appreciate the importance of the industry we represent. And again, the goodly attendance of practical dairymen gives me assurance that they are still doing what they have been doing in the past, viz.: trying to learn all they can about their business, and I would here say I have no fears for the success of the dairy so long as it is managed by brains. I am still further pleased by the fact that I am able to look into the faces of the dairymen before me and see plainly written thereon success, as the results of their labors the past season. And from passing events, as I noted

them, I knew I should see this plain-handed writing on our countenances.

The past season has been one so especially favorable for the prosecution of the dairy business that to have failed would have evinced such an amount of ignorance of the business and carelessness in its prosecution that none of you would be willing to have failure written upon your countenances. I beg your indulgence while I mention briefly some of the conditions and circumstances that have tended to make the past season one of such marked success. The first reason I give is, that the good Lord has given us the "early and latter rain," so that feed for our dairy stock has been abundant from first to last, thereby enabling us to secure the foundation of dairy success at comparatively small cost. And then again the season has been especially favorable for the manufacture of the finest of dairy goods. No great excesses of heat or cold; and I say here that the manufacturer that has failed to turn out first-class products the past season had better be at once turned out of the business or sent somewhere to serve as an apprentice until he learns his business. And then another and an important circumstance that has had a tendency to gladden the hearts of the dairymen, has been the uniformly high price they have been enabled to obtain for their goods. The season opened with all the conditions favorable for filling the partially empty purses of the dairymen. (The season of 1879 was so especially unfavorable that many of the dairymen got very nearly to the bottom of their purses.) In the first place the market was entirely bare of old stock, none of it in the way of a free sale of the new. And then again, the general revival of all the manufacturing industries of this country and of the old world as well, gave the laboring classes something with which they could buy our goods, and the result has been good prices from first to last. And another thing, the season of 1879, which seemed to be almost a failure, will, in its results, prove to be one of the very best. In my talk before the convention last winter, I predicted that the low price of butter and cheese last season had and would still induce our dealers to seek new markets for our dairy goods. And further, that manufacturers would give us new styles of cheese; styles suited to more of the markets of the world, and in that way do something towards relieving what seemed to threaten overproduction.

I am glad to tell you my predictions have been fulfilled to quite an extent (and we have only commenced in that direction). Now, instead of making almost wholly Cheddar cheese for the English market, we are making flats for the Southern trade, Young Americas, Edams and Goudies for the West India and South American trade, Switzer and Limberger for the Germans, etc. So I feel quite confident the partial halt we were compelled to make in 1879, instead of being a curse, will, I trust, in the end prove a blessing. Human nature is so constituted that it takes a little pressure to bring out the best there is in us. So the low prices of 1879 that touched us in our most sensitive part, viz., our pockets, has set us to looking around with results already stated. I am not able to give you the amount manufactured of these different styles of cheese. But there has been enough done to inaugurate a move in the right direction, and one, too, that I am sure will tell favorably upon the future of the cheese trade. And there is still another hopeful indication for the future of the cheese market. I refer to the attention that has been paid the past season to the wants of our home market.

Instead of trying to put upon the home consumers the poor stuff that was unfit to be sent to the Eastern market, as has been done by most of our factorymen for the past few years, the factories have most of them tried to give their home consumers something that was worthy the name of cheese, and the results have been quite satisfactory certainly to us that wanted a good bit to eat now and again. I say to you, gentlemen, factorymen, your best trade lies in that direction, and, in my opinion, you will stand very much in your own light if you do not look sharply after the profits of this market. While talking to the factorymen, I want to say one thing more, and yet it would seem hardly necessary that anything should need to be said to them at this late day about their part of the business. I have said before mainly what I shall say now, but my advice has not been heeded by but a few of them, so I shall repeat in hope that line upon line and precept upon precept may stir up many of you to your duty.

I refer to your facilities for caring for and curing your cheese after it is made. I am very certain that you are the cause of serious loss to your patrons in consequence of having such imperfect curing rooms. There is hardly a curing room in my whole

acquaintance that is so constructed as to guard against the extremes of heat and cold which we meet in this climate. I am fully satisfied that much cheese that is well made is damaged past redemption by the extremes of temperature to which it is subjected in the first few weeks after it leaves the press, and I do not know of one factory that is arranged so as to properly cure spring cheese. It is hardly worth while for me to take your time to go into detail of how curing rooms should be constructed, for I am quite certain that all of you know how to build much better than you have. In the infancy of the dairy business, when it was an experiment not certain whether or not we should make a success of it, there was some excuse for your using these imperfect appliances; but now, when cheese making has become a fact among us, it seems to me that your patrons have a right to demand of you facilities that will enable you to turn out the very best goods possible.

I am quite hopeful that, as the finances of the factorymen improve, we shall see some of its fruits in improvements in the direction I have indicated.

Taken altogether, were it not for one thing, the outlook for the future of the dairy business is very promising. As I have before said, the general prosperity of the country and the general improvement in the finances of all classes give promise that we shall be able to sell our goods at good prices, if we but furnish such goods as the markets of the world demand.

I wish I could, in justice to myself and to the association I represent, leave the subject just here. But I feel in doing so I should hardly be doing my whole duty. There are many members of this association that are pursuing a course that I think is calculated to work great harm to the dairy interest, and against which I feel it my duty to enter my earnest protest. I refer to the practice that is becoming so general of making butter and skim cheese from the same milk. I suppose my views of the practicability of making skim cheese are well known to most of you, and were it not for the command to give line upon line and precept upon precept, I should not feel that I ought to say anything upon this subject. I have both in private and in public entered my protest against this effort to make two things out of one, or as the boy tried to do, both eat his cake and sell it.

My advice has always been, either make butter or cheese, and

whichever you make, give it your very best efforts, and make the very best you can. You will please bear with me while we consider this matter somewhat at length. The practice is becoming so general that I greatly fear that the reputation which Wisconsin has established for her dairy goods is in danger of being sacrificed to our avarice.

This seems to me to be a very unwise thing for us to do. We have been doing the best we could for the last ten years to build up a reputation for our cheese in the English market, and just when our goods have taken the front rank in the markets of the world! considered of sufficient importance as to demand special mention in the market reports, and when we remember that this enviable position was attained by our persistent effort to make only the very best possible; while some of our sister states have suffered greatly in their standing in the market in consequence of so much skimming, we, by keeping the skimmer away from the cheese vat, have a reputation that is enviable, and not only so, but it is quite profitable. Now the question is, shall we, for a little present gain (mind I emphasize the word little), sacrifice the reputation it has taken us so many years to build up. I repeat, this course seems to me to be very, very unwise. It requires so much effort to build up a reputation, and it is such an easy matter to lose it. It seems to me it would be wisdom in us to think twice before we do anything that will in any way have a tendency to mar the fair standing we now have in the markets of the world.

I am aware I shall be met with the claim that more money can be made in making butter and skim cheese, than in making either butter or cheese alone, and it is quite likely that it is so, just for the present. But what if while we are making a little more money this winter, we are sacrificing our reputation, so that next summer when the market is cloyed and only the very best is bringing a paying price? Then when we come to look for our reputation for making only first class goods, we find it gone; sacrificed for the paltry pittance we have gained by our efforts in trying to divide one product so as to make two of it.

You will please notice that I am not willing to admit that much has been gained even for the present, leaving the question of reputation entirely out. I regard skimmed milk of but little value for the purpose of cheese making; but for feeding calves it is (if kept

sweet) almost as valuable as before the cream is taken off. Sweet skimmed milk will not fatten a calf as rapidly as whole milk, but in the matter of growth there is but little difference. Please remember in your criticisms on this statement, that I am talking about sweet skim milk, not after it has become sour and thick. One word will explain why sweet milk is so much more valuable than sour. In making butter or cheese in any of the present methods, we lose nearly all the milk sugar, and this is what first becomes acid, and you all know that there is neither growth nor fat in any acid. I am aware that the advocates of skim cheese will tell us the cheese is sold upon its merits, and that there is no deception about it. No one is compelled to buy it unless he wants it.

This is all very true. At any rate it is sold from the factory to the dealer for just what it is, for the reason that the dealer is an expert and cannot be deceived in the matter. But how about it when it goes out of his hands? Are any of you so confiding as to suppose for a moment that he is going to be particular to tell that he is selling an inferior article? Is he not a good deal more likely to try to sell it upon the reputation that Wisconsin has gained for making whole milk cheese? And when we remember the fact that many more goods are sold upon this reputation than upon their real merit, you will see an additional reason for jealously guarding our good name.

But for the sake of the argument, we will suppose that every man that has handled this cheese is an expert and has taken it for just what it is, and still further, the man that is buying it for his table is an expert and takes the skim cheese because it is a little cheaper (not because he likes it); he takes it home, eats a little himself, his family eat a little; none of them like it, and it lays around till it is dried up, and in the end a large part of it is thrown away and they come to the conclusion that they do not care much about cheese any way, and as a consequence they do not buy any more.

On the other hand, if we had sent out only first-class, mellow, rich cheese, by the time the first piece was eaten up (which would have been soon, for all would have been fond of it), they would have acquired a relish for it, and instead of coming to the conclusion that they did not want any more, would buy a larger piece next time. If you want to understand fully how this works, just think for a moment how it would be in your own house, or how it would

be with you. You know that after gnawing away at a tough, poor piece of cheese awhile, you give it up in disgust and conclude you do not care much for cheese any way. There is a well-established law of commerce. It is this: If we have anything we wish to sell, before we can do so, we must find a customer that wants what we have to sell. Now, as our tastes are largely cultivated, it seems to me it would be much more business-like and sensible to give our customers only such cheese as they would relish, and in that way do what we can toward creating a demand for our rapidly increasing cheese product. I had the privilege a short time ago of exam ining a sample of cheese that was made somewhere east. I understood the process of manufacture to be, first, take off the cream; then supply its place with lard — put in, I suppose, for shortening, as ladies put it in pie-crust. This was like all other efforts to make two things out of what was designed for only one. It was a fraud.

I know I shall be met just here with the claim that there is a demand for a certain amount of cheap cheese that the poorer classes may be supplied. I admit this claim has some weight and is entitled to some consideration. But I do not think it is at all necessary for us to make some cheese expressly for this class.

My experience in cheese making would lead me to the conclusion that, do the best we can, we shall be quite likely to make enough of this kind of cheese to supply the demand. At any rate we shall be glad we had no more when we come to strike the yearly balance. There is another matter that interests us as dairymen, and one, too, that is of interest to those of you who are not dairymen, but consumers of dairy products. I refer to the effort that is being made, not to adulterate butter, but an effort to pass off a bogus article as genuine. You will understand that I refer to the manufacture of oleomargarine and another combination called sueine. The first is manufactured from beef suet mixed with a small quantity of pure butter to give it flavor, and the other is a combination of lard and butter. There are different grades of these articles, depending upon the purity of the offal from which they are manufactured and the amount and quality of butter put in. My space will not admit of a detailed account of these manufactures, neither have I exact statistics as to the amount manufactured in this country and sent out as butter. But I assure you the amount would startle you if you had the figures, and it must be remembered the business is only

just in its infancy, particularly the manufacture of sueine, or as some wag has more properly named it *sow-ene*, and unless some unforeseen circumstance shall prevent, we shall be flooded with the frauds, greatly to the detriment of honest butter.

I know that some of the states have laws requiring the manufacturers of these goods to so brand them that the purchasers may know what they are buying. This is well so far as it goes, but the trouble is, it does not go far enough to expose the fraud where it will do any good. It must be remembered that it is from the consumers of our butter and cheese that the money finally is obtained. The dealers may know all about what they are handling, but if the consumer is deceived by supposing that he is buying good American butter when in fact he is only getting soap grease, the branding is of no practical value to the manufacturer of pure butter.

Now if some system of branding could be enforced that would notify the consumer what he was buying, the results would be trifling compared with what they are now. What I have already said about the sale of skim cheese will apply equally to the sale of bogus butter. I suppose few of you are so credulous as to suppose that the average dealer will be particular to tell his customer, when he asks for butter, that he is selling him a mixture, three-fourths lard and one-fourth butter; or, if it be some of the lower grades of the stuff, there will be little or no butter in it, only the oil of the lard churned with buttermilk to give it a little of the smell of butter. But, of course, the mouths of the dairymen that are making butter and skim cheese are effectually stopped, for they are doing the same thing, only on a smaller scale. They are making an inferior article, and their only hope of profit out of it is that somebody will be induced in some way to buy it for more than its real value. I suppose I have said enough to make my position in these matters clearly understood, and that is about all I expect to accomplish, and if the adulterations carried on by my brother dairymen were the only ones to be found in this country they would be comparatively harmless. I am sorry to be compelled to say that such is not the case.

We are told by those that are in a position to know, that the name of the articles of food which are adulterated in this country is legion. Scarcely an article of food we buy where mixing is possible that it is not done.

What, I wonder, becomes of the 20,000,000 gallons of glucose annually manufactured in this country, using 7,000,000 bushels of corn. Only a small percentage of it is used for legitimate purposes; then what becomes of the bulk of the product?

I will tell you. It is used to adulterate almost every sweet we buy in this country, and this is only one of the multitude of frauds practiced in this country, and I wish I could in truth say to you that none of them are more harmful than this one. But such is not the case. This one taxes the pocket heavily, but is one of the most harmless as regards health. One word more in regard to the adulteration of butter, and I will leave the floor for other and more interesting speakers. Possibly some of you may think I am needlessly alarmed in regard to this manufacture of bogus butter, and will tell me that good butter and cheese will take care of their own reputation. So they would, if we could devise some way to compel these frauds to advertise themselves, tell just what they are and what they are made of. But when they are at liberty to steal the name "Creamery Butter" and stamp it upon their packages, the case is entirely different.

For example, just see how it has operated in the western butter trade the past season. As I have before stated, western butter makers have for several years past sought by every means to improve the quality of their goods, so that they might be enabled to go into the markets of the world and successfully compete for the first place in the market. I am glad to be able to tell you that their efforts to obtain a recognition of the merits of their goods have been entirely successful; and I right here want to say that the transportation companies have nobly seconded their efforts, in the way of furnishing proper facilities for delivering our goods at the seaboard in as good condition as when it left the factory, and from the seaboard it has been taken to England and the continent in equally good condition, so that western creamery butter has come to be eagerly sought in the European markets; or rather, I would say, such was the case at the opening of the season of 1880. European dealers, recognizing the advantage of more direct communication with the producer, established agencies in the western cities for taking it from first hands, and the result was, very satisfactory prices and a ready demand for our goods, almost as fast as made. Now comes in the bogus butter. Unprincipled parties, seeing the

value of the creamery brand, used it to dispose of their villainous compounds, and the immediate result was to create suspicion in the minds of our European customers, and a final result to almost wholly drive these customers from the market. In conclusion, I would suggest that this convention take some action to bring this matter before our legislature, now in session, and if possible secure the passage of a law that will compel the manufacturers of these frauds to so mark and brand their goods as to plainly notify the purchaser of what they are and of what they are made, and then if they want to buy them, all right.

Now, ladies and gentlemen, this convention is open for business, and I would like that each of you consider this his or her meeting, and that it depends upon us individually to help to make it one of interest and profit.

DISCUSSIONS.

Hiram Smith, Sheboygan Falls — It is our good fortune to have Hon. X. A. Willard, of Little Falls, N. Y., with us to-night, and I know I express the wish of every dairyman present that we hear some remarks from him.

Hon. X. A. Willard — I was up nearly all night, and I do not feel very much like talking.

I have listened, with a great deal of pleasure, to the addresses that have been made, and the suggestions of your president. Among the suggestions that are valuable, is the one regarding curing cheese. He stated the fact, as he says, in reference to Wisconsin. I can say that it applies to New York and other dairy sections.

There is hardly a cheese curing room in the whole country that is a good curing room. That is one thing the dairymen should now pay particular attention to.

All cheese that is properly cured — that is, after it is cured — should contain about thirty-three per cent. of water. Now, if a cheese house is arranged so that the water passes off very rapidly, when it is cured, there will be less than thirty-three per cent. of water, and consequently the cheese is hard and does not mellow down. The water passes off too easily. After a cheese is prop-

erly cured, the water does not pass off. It is safer then than it is at first.

Englishmen who make the fine Cheddar cheese, which sells for the most money, are very careful in regard to their curing rooms. They are kept at a temperature of 70 degrees, and we know that England has a moister climate than here. It is not so dry, and consequently, in the first stages of curing, the water does not pass off so rapidly, and they get a very nice cheese.

There is another suggestion which the president made which I think something might be said upon, and that is, in regard to the adulteration of butter and cheese. He suggested that you should appeal to your legislature and have laws passed. That is all right, perhaps, but that is not really what we want. We want a law that will cover the whole United States, and every association and every dairyman. Every association in the United States should draw up a petition and then should urge upon their congressmen to pass it and stop this fraud. We shall never be able to combat it until that is done, because you may pass laws here in Wisconsin, while other states may adulterate their products. There are a great many states that are not engaged in dairying, and as soon as they are driven out of the dairy states they are going into some other states, and if this goes on for any length of time, the English people will look upon the dairy interests of America as a great fraud; there is no doubt about it — they are beginning to talk about it now. My English correspondents are very fearful that this thing will be carried so far that it will prejudice them against our food, and the dealers in London and Liverpool are anxious to have a very good article from America.

Chester Hazen, Ladoga — In regard to this adulteration, the suggestions made by our president, and seconded by Mr. Willard, to call upon our state legislature to pass a stringent law upon this matter, I think that our state association now in session should take measures to draw up a petition and forward it to our member of congress in Washington.

Hon. X. A. Willard — I should be very happy to hear something from Hon. Hiram Smith. He is a distinguished dairyman in Wisconsin, and I understand is at present in the house.

Hon. Hiram Smith — I hardly thought my friend Mr. Willard would take revenge so suddenly upon me. He has not the excuse

that I have. He is a guest of this convention from another state, and it was due to us, and we were all anxious to hear from him.

I am here at home where you have all heard me, and it will only be, perhaps, an infliction upon you and trespassing upon your time. But I am glad to see that this association opens under such favorable auspices; that our association was so generously welcomed by the president of this beautiful village, who, in his eloquent remarks, gave us to understand and know that he had considered this question and fully appreciated its importance.

We who have been long in the dairy enterprise know well the hardships we have passed through to gain the position we now occupy in this state and the dairy country in the United States, and it has been our study to learn to improve the quality and to increase the quantity. We have patiently labored to get out churnings amounting to from 25 to 30 pounds a day from 40 or 50 cows. But we are now menaced by a fraud that is turning out, at a *little-lean-to* near here, 2,000 pounds of butter a day with but very little butter about it.

Now what encouragement have we to go on in the hard road we have traveled with this fearful menacing not only cutting away our profits, but ruining the entire business. It is all very well to pass laws in the United States. I hope there will be laws passed, but I think it devolves upon dairymen to take a more immediate and direct stand that will be felt quicker than any law. Now we have unscrupulous dealers that are putting this upon the market. It is a fraud upon the consumers.

In the first place it commences with the theft of the reputation of good dairy products.

They begin as a thief, and end with fraud upon the consumer. These are the two ends of the transaction. Now I think it is wise for the dairymen all over the country not to send in a box or tub of butter to any dealer contaminated in this business. If we know that he is engaged in putting this stuff upon the market, cut off all dealings with him — send no butter or cheese to him. It is said there is nothing wrong about it, that the man who sells it knows what it is. This is true; but he sells it to another man just as one who has raised a $50 note to $100 needs another man to shove it out or counterfeit, you know.

Those manufacturers in the west need an accomplice to get it shoved out.

A man may go to one of these dealers and buy a car load of butter; he buys it because he knows what it is, but he sells it to the restaurants, cheap hotels and to dining-room cars on some of the railroads, and it goes into consumption. It is a fraud upon the consumer. You may brand the tub, but the grocer has it behind the counter, and he weighs out your two or three pounds and you don't see the brand. He has complied with the law.

I hope this convention will take some decided stand upon this important matter. It is in fearful opposition to the best interests of the dairy. We can't combat this, for while we are laboring — skimming our milk and making a good article, this stuff is rushing in and breaking down the market.

A prominent dealer in New York told me he had been in the habit of storing up butter for the winter trade, but now there was this oleomargarine held over him that was being sold at a lower price, and he was left with a store full of old butter.

Therefore the dealers have not dared to buy up large quantities of butter, and the consequence is, that it is injuring our good products. I hope some decided stand will be taken expressing our views upon this subject. It is not necessary for me to occupy any further time.

A. H. Wheaton moved that the convention adjourn until Thursday morning at 10 A. M.

MORNING SESSION,
THURSDAY, January 13, 1881.

MIXED FARMIMG AS GENERALLY UNDERSTOOD AND PRACTICED, A SNARE AND A DELUSION.

BY HON. HIRAM SMITH, SHEBOYGAN FALLS.

I am well aware that the opinions I intend to present will come in direct conflict with the opinions and notions long entertained by the great majority of farmers of the present day. Mixed farming has been highly extolled and recommended by most of the politicians and professors who have addressed state fairs, national and

international agricultural associations, and has been echoed, parrot-like, by many young lawyers and doctors who have addressed the thousands of county agricultural fairs. We read its praise in hundreds of paragraphs and editorials in the agricultural papers of the day. Therefore it is no wonder that unthinking farmers should believe in and practice the delusion.

Briefly stated, mixed farming consists in raising to sell, a few cows, calves, horses, colts, sheep, beef, pigs and poultry, fruits and roots, hay, butter and cheese, corn, rye, spring and winter wheat. And in the language of the old song:

"Oats, peas, beans and barley, O."

The theory of the advocates of mixed farming is, that by raising a great variety of crops, if one or more crops should fail, there would be others to fall back upon. This plausible but delusive theory is predicated on the notion that farming is not a question of science, but is a question of luck; of blind chance, or a vehicle through which the Deity metes out rewards and punishments, as in Pharaoh's time, when seven years of plenty was promised, and seven years of famine was threatened. The plenty was not promised on condition of good cultivation and a liberal application of manure, nor the seven years of famine for the lack of these, but both rested on the whim of the Deity. Also, in case of Jacob, who labored seven years for a wife, and was put off with a wall-flower, and then labored seven other years for the wife he had bargained for, with the addition of the ringed, streaked and speckled of the flock he had tended, which increase was greatly multiplied by a strategy, the efficacy of which died with the transaction. As in the case of the afflictions of Job, when a messenger announced that "God had sent a fire from heaven and burned up the sheep and the servants" (the sheep being mentioned first, probably on account of their greater value). The same idea of rewards and punishments prevails in the celebrated story of "Babes in the woods," where it is alleged that the murderous uncle was punished for conspiring against the lives of the innocent children. The poet says:

"His barns were burned, his goods consumed,
His land was barren made."

I once heard a sermon preached against Sabbath breaking, in

which the particulars and name of the farmer were given, who committed the sin of Sabbath breaking by hauling in his wheat on Sunday, and just as he had completed his work, a thunder storm came up, and the lightning struck his barn and destroyed his entire crop, as a punishment for his sin. This convinced me that a person had better do one of two things: either avoid breaking the Sabbath, or else buy a lightning rod. In more superstitious times, farmers depended more on the blessing of the priest for the success of the crops than on the application of manures; more on the efficacy of prayer for rain than on mulching the ground.

There are many farmers in our day more intent on planting in certain stages of the moon than they are in the pulverization of the soil; more confidence in certain breeds for milkers than they have in June-cut hay and ground feed; more faith in boring holes in the horns of sickly cows than in warm stables. More money is invested in the purchase of new varieties of highly pictured fruit trees than in pruning the vines and trimming the trees. All these past and present errors are the legitimate result of the widespread notion that farming, in all its varied branches, is not a science, and therefore needs no special education and training to insure success, while all admit that if a young man is designed for the law, the medical profession, the clergy or the counting room, he should attend some good school or college, and attend two or three years a special course of lectures, to fit him to commence his life work. He is expected to have time and opportunity afforded him to learn the history and the theory and practice of the lives of the most successful men in the profession he has chosen. A liberal education in the arts and sciences, in the laws of nature, in the history of nations, communities and men, enables him to form quick and correct judgment of the influences that control the action and conduct of men.

But in the case of the farmer the opinion largely prevails that a boy who has drudged in the treadmill of his father can emerge from his teens a full-fledged farmer, fully competent to engage in mixed farming. They say he was brought up on a farm, and knows all about it. He may be and often is ignorant of the difference in soils, knows but little about the nature and properties of the manures he ought to use, or what crops he could most profitably produce in the particular locality in which he lives. He knows but

little of the laws of trade, of the actual supply and probable demand for the various crops he is trying to produce; he has had no teaching in the intricate principles involved in successful stock breeding; he has but a superficial knowledge of who his real competitors are, and whether their natural advantages do not greatly outweigh his closest economy and severest industry. The best he can do is, to guess whether it is better to sell his hay, oats and corn, or put it into pork, beef or dairy products. He may spend a quarter of his life in raising wool on high-priced land at a loss, while his real competitor is growing rich raising wool on cheap land. An intelligent understanding of the natural advantages pertaining to his locality, and a thorough training in the proper business adapted to that locality, might have made him rich, contented and happy, instead of his unrequited labor, disappointed hope and financial failure. It is as absurd to suppose that any one man can become a successful horticulturist, a skillful cattle breeder, a proficient in raising grain, and a competent dairyman, as it would be to suppose any one man could be an able lawyer, a skilled physician, and a successful merchant. It takes the best years of a man's life to become master of any one of these branches of agriculture, or either one of the so-called learned professions. Farmers might and ought to learn a lesson from the management of nearly all other kinds of business, and take some one branch of agriculture and make that the main business of life. It matters but little what that branch may be, if pursued with growing intelligence, so as to utilize the natural advantages with which it is surrounded. If raising grain should be the chosen occupation, then all other business should be subordinate to the main object in view; then accumulated knowledge and experience should determine the proper rotation of crops, the manufacture or purchase of fertilizers best adapted to increase the yield, in the purchase of labor-saving machinery, and only such, as is best adapted to aid this main object of raising grain. If the occupation of dairy farming should be selected, then all inquiry, observation and experiments should be directed to make all crops raised contribute to the success of the dairy, the proper selection of cows, the most careful treatment, so as to promote health and contentment among them, for in this contentment largely consists much of the profits of the enterprise, the management of the pastures and meadows, the keeping up of a continuous supply of

just the right kind of food, in its best possible condition, to produce the cheapest milk, the converting of that milk into butter or cheese in its greatest perfection at the least waste of labor. The care of these products, while held in the manner, time and place for disposing of them, necessitates as close observation, as deep study, as long and patient labor, as it does to become a master mechanic or a D. D. in any of the learned professions. Fifty years ago, "Mixed Farming" was more of a necessity than at present. Exchanges were made of the products, instead of selling and buying for cash. I well remember, when a boy, that a certain manufacturer of hoes came every winter through Northern New York and exchanged his hoes for honey, feathers and butter; other peddlers from Albany came every winter with haddock, fresh cod and oysters, and exchanged them for pork, butter and venison for a return load. Money exchanges from one state to another were not made by draft, as now, but a one hundred dollar bill was cut in two pieces and one-half sent in a letter, and, on notice of its safe arrival, the other half was forwarded. If the parties lived five hundred miles apart, the transaction would require four weeks' time and four letters with twenty-five cents postage for each letter to complete the exchange.

Mixed manufacture and trade was formerly as common as mixed farming. A wagon shop was a place where you could get a two horse lumber wagon, an ox cart, a one horse dray, a two horse pleasure carriage, a one horse shay, or a wheelbarrow made by the same workman. The farmers' trade with a wagon shop, a shoemaker or a blacksmith shop, was by the law of custom payable in farm products. I have frequently collected small bills for blacksmith work of farmers, getting two bushels of wheat at one place, two bushels of potatoes at another, a smoked ham or shoulder of another (generally a shoulder) if not a chop, but all this is now changed from a dicker to a cash trade, and nearly all kinds of manufacture have been simplified and concentrated into one line of goods. Large factories now run only on lumber wagons, another on carriages, and still others on wheelbarrows. Sharp competition has long since driven mixed manufactories out of the market; men work to much better advantage by working at one branch of business. It takes seven men or boys to make one clothes pin to advantage. Every one works to the best possible advantage, so that

no one man can afford to make a clothes pin. What is true of this business is true of all manufacture. Thus, we see large woolen mills where nothing but shawls are made, another for carpets, another for cloth. Precisely the same principle prevails in regard to trade. We have wholesale and retail merchants engaged exclusively in dry goods, others in groceries, still others in hardware, clothing, boots and shoes, and so on through the whole list of staple articles. The same causes that have of necessity driven mixed manufactures and trade into special lines will as surely drive mixed farming into special productions; not alone for the reason that it takes so long to acquire correct knowledge so as to produce profitably many different kinds of products, as for the more potent reason that they cannot be produced so cheaply. Five farmers in a neighborhood engaged in mixed farming necessitates the purchase of much more expensive labor-saving machinery than if these five farmers were engaged, each one, in some special line of farming. A dairyman does not require a self-binder and grain drill; a grain farmer does not require a hay loader and tedder; a pork and corn producer does not require either of the above machines, but instead, horse cultivators and planters. Thus you will preceive that the five farmers must have in the aggregate (for mixed farming) a larger amount invested than would be necessary if each one was engaged in some special branch of agriculture, and the aggregate receipts would be no more, and in all probability would be less. It is a well settled principle of finance that the profits of all enterprises must ultimately be determined by the amount of capital invested and labor expended, compared with the aggregate net receipts obtained. Thus, the conclusion is inevitable that five farmers engaged in mixed farming, with largely increased invested capital, and the disadvantages to labor by the necessity of beginning and finishing many small jobs of work required in mixed farming, with no possible chance of increasing aggregate receipts above the amount that can and are produced by five farmers engaged in special lines of production. Therefore, it is a delusion to suppose that larger investments, increased labor and lessened receipts, can by any legerdemain, be made more profitable.

I would be glad, in this connection, to give accurate statistics showing a comparison between mixed farming and those engaged in special branches; but, after much inquiry, I was unable to find a

single farmer that had kept a book or could give any intelligent understanding of his farm operations. None were able to say whether their net receipts were five or five hundred dollars above their expenses, but nearly all would assert that no farmer could make three per cent. on his investment. I have interviewed farmers engaged in pork, raising corn to feed them, and clover pastures for summer use, with but small investments for barns and machinery, whose profits were satisfactory; also stock breeders, where the man was adapted to the business; their profits were ample. It might be supposed that in a state so largely devoted to dairying as Wisconsin, it would not be difficult to procure accurate statistics of exclusive dairy farming, but I have been unable to find anyone so engaged. All men are liable to have fits of the *shallows*, and it affects dairymen in this way: They think they can raise better cows than they can buy. Last November, I bought a three year old heifer for twenty-five dollars. No particular breed; no extra care in raising, and she has given by actual weight an average of 36½ pounds per day for the past six weeks. Five years ago, I had a fit of the shallows, and raised four half-blood Ayrshire heifers. They are beauties and praised by all, but not one of them ever gave 36 pounds of milk per day, in the best of the season, and yet they are profitable cows, but no better than I can buy.

Being unable to find anyone engaged in exclusive dairy farming, except myself, I shall therefore be obliged to give statistics from my own farming, which I should prefer not to do, hoping thereby to draw out volunteer statements from some one engaged in mixed farming, that by a comparison of occupations we may arrive at best results. It may be proper to state that about one hundred tons of hay, five hundred bushels of corn, six hundred bushels of oats and six acres of fodder corn were raised and fed out to the stock.

Statement of farm account for 1880: 211 acres of land, 20 acres woods. Stock, 52 cows 6 horses, 13 hogs.

Receipts for butter	$2,930 85
Receipts for sour curd	303 48
Receipts for calves sold	119 00
Receipts for hogs	164 00
Total receipts from dairy	$3,517 33
Average per cow for 52 cows	67 63
Other receipts from farm	203 00
Total receipts from farm	$3,720 33

Paid for hired help	$925 87	
Paid cost for board	400 00	
Paid cost 23 tons of bran	208 85	
Paid difference between 8 cows sold and 8 cows bought	77 00	
Paid for plaster and dairy supplies	67 00	
Paid for blacksmith work and repairs	97 00	
Paid for grass seed, thrashing and husking corn	76 00	
Paid for taxes and insurance	110 00	
Allowed for superintending	500 00	
		$2,467 62
Net receipts		$1,252 71

It will be perceived that the net receipts of $1,252.71 is a sum sufficient to pay six per cent. interest on over $20,000, and there is less than that sum invested in the business. Special farming, in addition to being more profitable (as I believe), it is much more agreeable, as all work can be done in season, fewer kinds of crops are required, and one crop will not be running to waste by being over ripe before it can be attended to. There will be no thrashing until dark and the cows still to milk. There will be no dead sheep to skin on Sunday; no unruly colts to chase out of mischief in the rain, and no bunting calves to smear your Sunday *breeches;* lessening the drudgery and increasing the profits, will elevate the business of farming, and elevate the men and women engaged in it.

Prof. Henry, University, Madison — I would like to ask Mr. Smith how he determines the weight of the milk of the cows spoken of. Whether he guessed at the weight, or whether he weighed it every day or after each milking or once a week?

I often hear men speak of how much milk a cow gives. Some will say so many patent pails full or so many quarts.

Hiram Smith — I am glad the question is asked. We keep a spring balance in our barn. This cow, whose weight of milk we were ascertaining, usually gave 22 pounds in the morning and from 15 to 17 pounds in the evening. Every particle of milk she gave was accurately weighed and entered in a book opened for that purpose. We did it mainly, in the first place, to determine if increased feed would not increase the milk. We took two cows, one Ayrshire and one native breed. We had been feeding the native three meals a day and the Ayrshire only two. We increased the Ayrshire's feed by one meal. Her regular feed had been one quart

of ground feed and one quart of bran. We found that by feeding the Ayrshire this additional feed at noon, the weight of the milk from the two cows was increased five pounds.

Hon. John Luchsinger — I would like to ask Mr. Smith whether this experiment has convinced him that the native breed is better and more profitable to the general dairyman than the imported dairy breeds?

Hiram Smith — I am not competent to speak in regard to other breeds. I have some half-blooded Ayrshires that are very satisfactory, but I am not competent to speak of a great many breeds. I have a project in view, and I think it will be put in force upon the Experimental Farm at Madison.

It is proposed to take a good selection of native milkers that are as far removed from all the different breeds as possible, and see if they can't be improved just as well as the imported stock. We hope to make a Wisconsin breed of good milkers. If we can, we shall probably experiment in that direction.

Prof. Henry — At Cornell University's Experimental Farm, they make milk to sell to the boarding houses, and do not attempt to make butter. The milk from the cows is weighed just as Mr. Smith has told you, and last year the native cow produced over 8,000 pounds of milk within twelve months. There was not a cow which was to be farrowed the next year either. I cannot give the exact figures, but it was over 8,000 pounds from the native cow. The cow was well cared for and well fed. They don't attempt in these experiments to get something from nothing. The cows are kept in the farm stable and carefully treated. When a man with fancy stock can do better than that, I wish he would put his figures where we can see them.

E. P. Ingalls, Milford — I have a native cow that gave 11,000 pounds of milk in one season, and I got 90 cents per one hundred pounds at the factory. She has given over 10,000 pounds so far this season.

Prof. Henry — I am glad this fact has been brought out. I would say that I would like to see at the next convention a statement which gentlemen are willing to swear to. I would like to have five men in this convention bring a sworn statement that their cows produced so many pounds of milk.

E. P. Ingalls — I only measured my milk for one week. I believe a good cow does better than most people give her credit for.

Hiram Smith — That would be no criterion. We want her average amount for the season.

Chester Hazen — I think a man has a better chance of making something, if he raises two or three things instead of only one. Now some men, either from being unfortunate or incompetent, lose, for instance, their wheat crop, and if they are not raising anything else, have nothing to fall back on. Some men are not as good farmers as others, and they ought to raise several things, so if one fails they will still reap a harvest from their other crops.

Col. B. R. Hinckley, Oconomowoc — I would ask Mr. Smith by what process he would replenish a poor grain farm where they have raised grain as a specialty. I have always been in the habit of talking to my neighboring farmers and I have deprecated following the system of grain farming. The plow is something like fire and water — a good servant but a bad master. It will surely ruin a man.

Hiram Smith — I think it has been pretty well demonstrated that there is sufficient recuperative power in clover, by alternating the crops, to keep up the fertility of the soil in raising any kind of grain or other product.

I think professors of agriculture tell us that there is only about three per cent. of any crop goes out of the soil. The balance is from the sun, rain and floating particles in the atmosphere. I saw it stated recently that, by a proper rotation of crops, at least 150 crops of grain could be taken from the same piece of land. Farmers have found that the rotation of crops with grain and clover is cheaper than hauling manure. Here is an idea you would do well to remember — that by increased knowledge we lessen labor and maintain the receipts, if not increase them. I do not agree with Mr. Hazen, because, if a man is not competent to do as well as some others, does it add to his probable chance of success to complicate his business with selecting others and then losing? It seems to me the very point he raised was one that would prevent him from spreading out into various branches and scattering his efforts. It certainly would be as well to center what force he has on one or two lines of business naturally adapted to each other.

For instance, corn and the dairy business go well together, for the corn would contribute to the success of the dairy business.

Chester Hazen — I am glad the gentleman will give us a little

leeway, and now gives us two instead of one, which I think is not enough.

Hiram Smith — It is about the same as taking a glass to get a drink of water. It takes the glass and the water to get a drink. [Laughter.]

W. D. Hoard — Mr. Hinckley asked the question, How you would renew the fertility of the soil? Soil that had been worn out by foolish cropping by grain. I have an experience of my own to give in this matter. I have a pair of eyes, and I make my neighbors contribute to my knowledge. I will give you the history of one man.

In eighteen hundred and — I won't tell when, but about twenty-eight years ago, Mr. Charles Phillips came into Lake Mills with about $2,000. Mr. Phillips was a man who was unable to work. He had been afflicted with a feeble constitution, so that he had but little physical energy, but an active, growing mind. He died two years ago, worth $100,000, with $60,000 worth of land that he had accumulated right around him in legitimate, straight farming. The practice that Mr. Phillips pursued was to buy impoverished wheat farms that his neighbors had foolishly ruined.

I remember one farm he bought at $26.00 an acre. That was ten years ago. You could not purchase that farm now for $50.00 an acre. His practice was to sow about three times as much clover seed as is ordinarily used to seed an acre, and to sow it with his grain. He never sowed a spoonful of grain that he did not sow clover with it. No matter whether he expected to crop that in hay next year or not. This was his reason: Suppose, he says, when next spring comes, that the certain lots I expected to seed down, I find killed. You know it is quite a common thing to find a clover lot killed here, and another sound there. I therefore seed all, and the clover comes up in the summer and pays me well. If it is necessary for me to plow that land next spring, all right; I have clovered it. If I want it to remain down, all right, for I have clovered it. In either case I have done the best thing possible. The result upon that land has been an increase of fertility. He has been an extensive barley raiser, and an extensive dairyman. He had up to two years ago, $50,000 worth of Alderney cows — grades and full bloods. He told me one thing that I wish every dairyman and farmer would think of. He said, "It was a God-

send that I could not work. Had I been endowed with a strong pair of hands, I would probably have stepped into my field and pitted myself against a hired man at $1.50 a day, and have been content to work out my salvation with my hands, and let my head run up to weeds. But I could not work, therefore I commenced to think whether I could not employ more labor with more profit." If there is anything that the farmers all make a blunder in, it is in this everlasting cry, "I can't afford to hire." He said, "I can hire a German at $16.00 a month, and I can hire thirty, and I must train my head in the business and see how I can employ these thirty men and make a profit on their labor." He said, "It was a God-send to me that I could not work, for if I had been able to work I should probably attended to work and let it go at work."

This is, in a few words, Mr. Phillips' system for renewing impoverished farms, and he made a success of it.

Pres. Favill — He recommends us not to work, and that just suits me.

Col. Hinckley — I agree with Mr. Phillips' mode of farming. It is possible that I am laboring under a delusion in regard to worn out land.

Voice — It is not because you worked too much.

Col. Hinckley — No, that is so; but I had believed, and do still, that a piece of land that has been worn out by grain growing takes just as long to become fertile again. Unless you bring on foreign matter it will take just as long to recuperate it as it did to deteriorate it. When you put on three times the ordinary amount of clover on land which has deteriorated, it won't grow high enough to cover a gopher. [Laughter.] For years I never sowed a kernel of grain unless I sowed clover with it. I never lost five bushels of wheat by chinch bugs in my life, for the reason that my land was not deteriorated. I have raised clover crops high enough so that the reaper would cut off large quantities of it.

Hiram Smith — I move that the president appoint the committees needed, during the convention.

President Favill appointed the following

COMMITTEES.

On Resolutions — Hiram Smith, Sheboygan Falls; C. R. Beach, Whitewater; W. D. Hoard, Fort Atkinson.

On Nomination of Officers — Chester Hazen, Ladoga; H. J. Bumford, Plymouth; H. A. Congar, Whitewater; E. P. Ingalls, Milford; C. P. Crossfield, Fort Atkinson.

On Finance — O. P. Clinton, Waukesha; O. Z. Olin, Waukesha; E. Baumont, Waukesha.

On Dairy Implements — Geo. Lawrence, Waukesha; A. H. Wheaton, Auroraville; Bina Holden, Sheboygan Falls.

Judges on Butter and Cheese — A. H. Barber, Chicago, Ill.; R. F. McCutchan, Cold Spring; Ira W. Strong, Sheboygan Falls.

MANUFACTURE OF SWISS CHEESE IN WISCONSIN.

BY HON. JOHN LUCHSINGER, MONROE.

In most countries where agriculture has been carried on for long periods of time, the soil and climate, and the tastes, habits and intelligence of the people have combined to fix upon certain products of the soil characteristics which distinguish them widely from those of other localities. By following and improving upon the mode of feeding or breeding found from choice or necessity to be the most successful, there has been attained an excellence and fixed character in the products of the field and dairy, and in breeds of stock, differing widely and favorably from the same products in newer countries with the same conditions of climate and soil, but whose inhabitants have not yet learned by experience the mode of culture which is best, the breeds of stock most profitable, and the most excellent ways of manufacturing the products. Thus it is that intelligent experiments, coupled with proper and favorable conditions of soil, climate and people, have produced breeds of stock in various parts of Europe that are the most excellent attainable under the conditions in which they were raised. In this way only has the so-called thoroughbred stock of all kinds originated, and not, as too many of us have long supposed, through some lucky chance. This excellence can only be kept up and propagated when transplanted to other countries by conditions if not exactly identical, as near it as possible. Thus it would be mere folly to expect to improve or even maintain the good qualities of English Short-horns upon thin, hilly and rocky lands, or to maintain the excellence of Holsteins, Ayrshires, or any of the

improved milk-producing cattle, under any but as favorable surroundings as those in which they originated and were improved.

So it is with other products, particularly those of the dairy, and especially of cheese; no product of the farm has been so much affected, and divided into more varieties by the mode of manufacture, climate and the habits and tastes of people, than this. The result is, many varieties excellent of their kind, and mostly under certain conditions more profitable to the dairyman than the standard variety; but which can only be successfully, and therefore profitably, made under similar or nearly similar conditions, under which they are produced where they originated.

Of the varieties which it has always been felt desirable to transplant to this country, Swiss cheese stands foremost. The extended demand at high prices, its fine, creamy flavor and unequaled keeping qualities have been the means of introducing and encouraging its manufacture in favorable localities to an extent not generally known.

Swiss cheese is peculiarly a product of conditions and location. In Switzerland, economy in all matters is a condition of existence, owing to the poverty of the country from an agricultural point of view. There cheese is mostly made in rude huts built on or close to the high rocky pastures on the mountains, which are for the most part inaccessible for teams, and are not inhabitable for seven months in the year. The cows are driven there in the spring and remain with the herdsmen, milkers and cheese makers until the early snow compels them to leave for the valleys. The supplies of food and other necessaries are brought on narrow paths on the backs of horses or oftener on those of men; the product of the dairy is taken away in the same manner. The utensils required for making the cheese are few and inexpensive: a large copper kettle, some wooden hoops, a stout table, and a most primitive press, consisting of a long beam of wood with a weight of stone at the outer end, comprise nearly the whole outfit. The formula for making Swiss or Gruyere cheese published in the Report of 1880 is so nearly the mode in general use that it is unnecessary to repeat it here.

The points in the making which distinguish it are briefly as follows: 1st. The milk is put into a circular copper kettle instead of a vat, the kettle being hung on a crane over a fireplace.

2d. After coagulation, which is allowed at the usual temperature, the curd is not smoothly cut into squares, but is rather torn apart with a wooden implement, usually a stick with prongs inserted crosswise.

3d. The whey is not drawn off, but after the requisite scalding from 120 to 140 degrees Fahrenheit, the curd is allowed to settle at the bottom of the kettle, forming a compact mass, which is lifted out as a whole with a sort of net, and the hoop, which is open, is placed around it and then drawn together until sufficient.

4th. The curd is not salted until the cheese has left the press, when salt is rubbed on the outside and renewed daily as it is absorbed, until the cheese is sufficiently salted, which is in about four weeks.

The Swiss emigrants who came to Wisconsin in 1845 and afterwards, and settled in Green and Winnebago counties, commenced making cheese soon after they were located, first in a small way merely for their own use. Owing to the herbage, climate or other causes, the quality was often poor and at best very uneven, there being often as many flavors as there were cheeses. After many experiments, and in many instances much loss from spoiling, many times has cheese that to all appearance had been properly made been found after a few days of sultry weather bloating and spreading until it overhung the broad shelves in festoons, to the loss and disgust of the owner and despair of the maker, a fair article was made which found ready sale at good prices. Encouraged by this partial success, and finding by experience that the treatment of the milk and care of cheese must be varied to correspond with the frequent and sudden changes of the weather in this country, the production has steadily increased and the quality become better and more uniform, until at present it will compare favorably in appearance, flavor and keeping quality with the imported article, and is often sold as imported after reaching dealers' hands. There are authentic cases of cheese being shipped to New York and from thence sold to Chicago dealers as imported, at corresponding prices. Under certain conditions it is for the skilled maker the most profitable cheese that can be made. One of these conditions, and the most important after good cows, pasture, pure water and proper manufacture, is the art of utilizing the whey for butter making after the cheese is made. The whey is heated to boiling and then put into shallow

vats and left for twelve hours, the cream which has risen is taken off and churned, and makes, with careful management, an excellent butter for cooking and pastry, being much preferred to lard by those who have used it. In cool weather a really fine article is made, which sells for nearly as much as good dairy butter; the quantity produced is —— pounds to —— gallons.

After the cream has been taken from the whey it is again heated, and a sufficient quantity of acid whey added, when a second coagulation takes place, and curd is deposited, leaving the whey almost as clear as water. This curd is used for food to a great extent among the poorer classes. One would suppose that the milk had now served its utmost good, but in many dairies the whey is fermented and a very good quality of vinegar is obtained. The last two processes are as yet but seldom practiced in Wisconsin, but whey butter is made by most Swiss cheese makers.

It is plain, however, that Swiss cheese of good quality can never be made on so large a scale as to overstock the market.

1st. Because while a fair article can be made on any good dry lands with skillful treatment, the best results are only attainable on soil, and under conditions which most resemble its native home. The limestone hills of portions of Wisconsin and other northwestern states have proven most favorable for the production of a first-class article. On low lands failures are almost invariably the rule.

2d. Because the process of manufacture, as is evident from the description of the mode employed, cannot be varied to work on a large scale unless at great expense and at the risk of injuring the flavor of other characteristics.

3d. While it is true that the price is uniformly higher per pound, it is also true that less pounds are made from a given quantity of milk, it requiring 12 to 14 pounds to make one of Swiss cheese, while Limberger cheese takes only 8 to 9 and Standard 9 to 11. The risk of cheese not being uniform in quality is also greater, as until properly cured, it is very susceptible to changes in weather, especially in warm weather. Many makers have not the patience nor skill to properly make the auxiliary product of whey butter, which, where a large quantity of milk is worked up, is an item of importance, amounting often to the wages of the help employed.

Green county is the principal seat of the manufacture in this state; there are thirteen factories with a production in 1880 of

500,000 pounds. Winnebago is next, with six factories and a production of 150,000 pounds; there is also some made in Crawford and Buffalo counties. The aggregate amounts to about 800,000 pounds for Wisconsin. The class of people engaged in making this cheese are, without exception, Swiss or their descendants. This, together with the fact that the greater portion of country occupied by them is hilly, dry and well watered by springs and brooks, and the climate, excepting mid-summer, analogous to that of Switzerland, will account for the great and increasing quantity and uniform good quality of Swiss cheese made. That the quality is good, the constantly increasing number of points from whence orders arrive testify; orders have been received and filled from all large cities in the Union. The supply has always given out before the demand was satisfied. Already now, January 1, orders are being returned unsatisfied, the cellars being bare of cheese. At present, Americans have not ventured upon the making of Swiss cheese, although almost every other variety has been copied, and some have even been improved, but it will be strange if American enterprise and intelligence waits long before it turns to this branch of cheese making, which promises such satisfactory and remunerative returns.

President Favill — You all know it takes money, the old saying used to be, "to make the mare go."

We want some money out of this audience. We want every gentleman and lady present to join this association and pay one dollar; just one dollar, which is a very little.

And think for one dollar what we will give you: 1st, the honor of being a member of the Wisconsin Dairymen's Association. That is worth one dollar, and then next spring, perhaps about March, there will be published a report of these proceedings surely containing one dollar's worth of information, and we will give you each a copy.

I want to say just here that I make this offer: If any of you, after carefully reading a copy of your report, don't think you have received one dollar's worth of information, just mail that report to me at Delavan and I will return your dollar. That is made in good faith. I know that any man who will read that report will no return it to me.

That is not all we give you. The special arrangements made with hotels that every member of this association be entertained at one dollar a day.

Then if you are members, you will be returned to your homes at one-fifth of the regular fare.

Now all this we give you for one dollar, so don't fail to give us your name and your dollar.

WINTER DAIRYING IN WISCONSIN, AND THE INS AND OUTS OF BUTTER MAKING.

By GEORGE LAWRENCE, Jr., Waukesha.

You can scarce expect one of my age in dairying to instruct or educate you that have made this subject your life-long study. Yet we can elucidate on a few important points.

It is a certified fact that Wisconsin, with her highly improved farms, increasing in valuation, has or must give wheat growing as a specialty, the go-by; it is one of the things of the past.

Our farmers are far-seeing enough, with these high prices of land and the uncertainties of the wheat crop, to perceive that they cannot compete with the cheap lands in our younger adjoining states, where wheat growing is less uncertain.

So we are led to find some other product that is more certain and better pay, such as butter, cheese, beef and hogs.

But we well know that beef and hogs are not for us to hope for, only in an intermediate way; for we have only to look at our broad prairies and fertile plains of the south and west, where it costs little or nothing, compared to our locality, to grow and fatten stock.

But in butter and cheese making we can compete with any state or country on earth. We can solve the exorbitant transportation question with these products, reduce the bulk and increase the values, if we but stop and think how much railroads are making from year to year and realize that two thirds their income is made out of the farmers. When we ship wheat, corn or oats to the seaboard, it takes the profit the farmer ought to have himself.

It costs no more to send twenty-two thousand pounds of butter to New York, worth at the present time six thousand six hundred dollars, than it does twenty-two thousand pounds, or three hun-

dred and sixty-six bushels of wheat, worth so many dollars; in other words, it will take eighteen cars of wheat to equal one car of butter value. Thus you see how much we can do for ourselves in this one thing.

What we in Wisconsin must do is to grow more grass and raise more corn, and condense their values by feeding to dairy stock. This will pay us two-fold: First, we are receiving a good compensation for our labor and investment from the products; second, we are improving our farms by returning to the soil what we take from it, by way of dressing.

A farm heavily stocked now, with twenty or forty head of cows, can in a few years double the number and handle as easily as with the few in number. The longer this method is continued the more are our returns and the larger our crops of grass and corn.

We are fortunate enough to live in a land of health and beauty, where flowing water, as pure as crystal, natural and different varieties of tame grass abound on almost every farm, within a dairy belt running from east to west. Our climate, suitable to dairying, moderate in summer and not over boisterous in winter, thus making Wisconsin a natural dairy state. Our farmers, or I would say dairymen, for every farmer is a dairyman, for no farms are run without more or less cows, have not taken advantage of what nature has provided for them.

We are trying too many things, working on the plan of mixed husbandry, growing this crop and that crop, feeding a little beef and making a little pork, growing a little wool and milking a *few* cows; while all this is very well, yet we would advocate some specialty.

No man in business would think of dabbling in bank stock, packing pork, running a woolen-mill and buying butter and cheese. We would think him rather wild; and we very seldom find a business man doing business on this plan, and if we do we most certainly find a failure on his part; and until we farmers do business on a business basis we will come to an untimely end.

We have got to make some one thing a specialty, and as nature has provided us with everything pertaining to dairying (even to sweepstake butter and cheese makers), we are naturally led to this business.

You may be led to look this way and that way, do something in

this line or do something in that line, but it is a certain and a conceded fact that as sure as water runs and grass grows, we shall live to see the time when Wisconsin's farmers will make dairying a specialty. It may not all come around in my time, but some may live to see the day.

The dairyman or farmer that begins in this line first will be the one to succeed first.

When a number of this kind in a neighborhood join together in dairying, it gives encouragement for some one to erect a cheese factory or creamery, thus bringing the products in merchantable shape for market, by having the milk worked up at these places.

We are quite well satisfied that summer dairying has met with good success throughout the state. But until dairymen do business on a business basis, working the twelve months instead of six or seven, as is the rule now, thereby having an income the year round, they will have spasmodic ideas of dairying. Some imagine that it will not pay, and others are as emphatic in their praises that it will pay.

We have many hindrances and drawbacks to winter dairying, such as long winters, cold weather, stormy days and muddy roads, and too many indolent farmers, that prefer to take comfort by the well filled, blazing stove, rather than bother to handle milk through winter.

When we consider the products of cheese, we may say summer is very suitable to its manufacture; but when we consider the products of butter, we may say with emphasis that it does pay through the winter.

We live in an age of progress, and things and modes in dairying advance with the times. The new plan of collecting cream from small dairies and delivering to creameries is one of the new ideas, thus saving the good wife all the anxiety and trouble of setting the milk in pans, and churning, realizing as much for the cream as the butter would bring.

Creameries that are built with all the conveniences for making butter, summer and winter, can manufacture a more uniform article, and realize enough more for the product to pay the farmers as much or more than their butter would bring them in market, and this with no trouble.

Some of the drawbacks to winter dairying on the old plan are,

labor in the house and no suitable place for setting the milk. Churning by hand is a big job, especially if it takes all day to get butter, as is sometimes the case. Cows are poorly cared for; left out in the cold wind; on stormy days, drawn up under the fence, or under the lee of a straw stack. The hay is poor, improperly cured; cut too ripe or put in too wet, making poor feed for any purpose. The corn fodder was cut by frost; unfit to feed anything, much more make milk.

How easily all these things can be overcome; have our corn fodder in abundance, and in the best of shape. Cut your hay while it is green, and properly cure and house the same before it is spoiled.

Let our cows have an abundance of the most assimilated food. See how much we can make them eat, not how *little* they will eat.

Give them a good warm stable, make them as comfortable as possible, and my word for it, they will repay for all extra time and care.

Running a dairy the entire year is somewhat a problem with us in Wisconsin.

Some feed high, and by the time the cow is dry, she is in good fair condition for the butcher.

Sell and replace with a new milch cow.

Others keep one-third more cows than they milk, leaving part dry, and many make winter dairying a specialty.

This plan has many advantages.

The cows go dry in summer and recuperate for winter.

The products are put upon the market in the winter and early spring, when there is no extra surplus, and correspondingly high prices for these products are received.

Then, again, during haying and harvesting or the busy season, there is no milking to be done.

Then, on the new plan of collecting cream right from the door, no trouble of churning or inconvenience of selling, no store pay, but cash the first of every month.

Instead of the butter bringing ten or twelve cents per pound, as in summer when the market is over-stocked with everybody's butter, they realize from twenty-five to thirty cents.

We do not expect to see every dairy run the year round, or all run a winter dairy exclusively, for that would not do. The reverse

would be in favor of summer butter, but we have no fears of any such revolution.

We well know the winter dairy will be run by the intelligent, the investigating man, that figures the profits and losses, always has milk to make butter with when everybody else has none.

As we said at first, beef and hogs would be an intermediate affair, and the hog prodnct, with a well regulated winter dairy, is a big auxiliary.

Winter or spring pork generally pays better than early fall pork, and this is very easily handled, with plenty of good sweet milk, such as the winter dairy has, a little meal feed, and good warm comfortable quarters. But the dairyman that can run his dairy the year round will give the best satisfaction.

Produce what milk you can during the summer months, while feed costs nothing, comparatively speaking, and crowd the thing through the winter when dairy products are scarce and high, and thus realize a good income twelve months in the year.

We well know Wisconsin is not reputed for extensive winter dairies at the present time, but we look for a big increase in the near future.

One thing we must do is to crowd the spurious articles that are placed upon our markets, called by the name of butter.

We may law and legislate until we grow gray, and it will not eradicate poisonous articles from our midst.

In talking with a manufacturer of this compound, he states:

"You need have no fears of us or our imitation goods. All you dairymen have to do is to produce a better article than we do." He says we can, if we are fortunate enough to have cream, produce a better article than he can from tallow.

What we dairymen have got to do is to produce the very *best*, and place it upon the markets fresh.

No long kept butter will satisfy the educated tastes of people that are willing to give remunerative prices.

This swindling class, producing something out of nothing, as we may say, is being rapidly created in this country, from which, if the processes at work are not checked, the greatest danger is to be apprehended. These parasites are fattening on the life's blood of our dairymen. We have labored long and faithfully to establish a reputation; and now we have these leeches sticking to us, palming

off their spurious compounds in markets, and undoing all we have done.

Western is a name that consumers are beginning to look out for with some doubt.

The eastern markets are rejecting many western dairy goods, and foreign markets are suspicious.

If we consider the ins and outs of butter making, we think these leeches have their outs or soon will have, for the people are beginning to awake from their slumbers, and these manufacturers of spurious compounds will be ousted.

If a man or a company should manufacture five hundred dollar bills, imitating the genuine government bond very closely, and place them upon the markets as United States money, what would be the result? The penitentiary would be his home.

It is not only one class of people's business to punish these offenders, but it would be everybody's business.

Companies are organized with a large capital and manufacture imitation butter. This is nobody's business, only the dairymen, to look this matter up, when in reality it requires the consumer as much as any one, and ought to be everybody's business.

These leeches may have their ins for a while yet, but they *must* be ousted, *must sell* their goods, the same as other people do, for just what they are. The honest dairyman, who places his goods on the market pure and unadulterated, is the man who has his ins not only then and now, but will continue to have them. "Murder will out" sooner or later. So the people will find that they are imposed upon by trying to make them eat colored lard, fixed up tallow and a conglomeration of all kinds of grease, instead of butter. But, brother dairymen, this is only for a time; this thing will outdo itself with a high-toned advertising. We must get a divorce from these leeches, and the sooner the better.

W. D. Hoard moved to adjourn until 2 P. M.

AFTERNOON SESSION.

President Favill called the convention to order, and introduced Prof. X. A. Willard, of New York.

NEW DEVELOPMENTS IN DAIRYING.

PROF. X. A. WILLARD, of HERKIMER CO., N. Y.

MEASURING THE BUTTER-FAT IN MILK.

Ever since the establishment of the factory system, an effort has been made to devise some simple way of measuring the richness or fatty matter in milk of different herds, as delivered at the factory. The fact that all sorts of milk are received alike on the simple standard of weight or measure, was an argument used with great force against associated dairying at its beginning; for although the scientific side of the milk question was not understood so well then as now by dairymen, their observation and experience had taught them that milk of different cows and of different herds varied in quality according to a number of conditions, such as breed of cows, the time of the year when milked, distance from time of calving, the liberal or scanty supply of food and its quality and suitability for producing rich or watery milk. The man who had a choice herd of cows, who fed liberally and gave them the best of care and attention, hardly felt satisfied that his milk should be held at no higher standard at the factory than the milk of a miserable scrub herd, half starved for want of proper food, and badly cared for; and yet there was no apparent remedy, since there appeared to be no feasible way for the factory manager to tell the relative value of the different messes of milk coming to his hand. It is true he had the lactometer and cream gauge, by which the fraud of badly watered milk could be determined; but even with the cream gauge and lactometer watering was often practiced with impunity, because a wide latitude had to be given for the variation in milk, and hence, unless a man was actually caught in the act of watering his milk, the courts would not convict. Vœlcker analyzed a large number of samples of fresh milk — milk *known to be pure*, and from cows well fed and cared for in every respect — and he found the variation in genuine cows' milk to be as follows:

	No. 1.	No. 2.	No. 3	No. 4
Water	83.90	85.20	87.40	89 95
Butter	7.62	4.96	3.43	1.99
Casein	3.31	3.66	3.12	2.94
Milk-sugar	4.46	4.05	5.12	4.48
Mineral matter (ash)	.71	1.13	.93	.64
	100 00	100.00	100.00	100.00
Percentage of dry matter	16.10	14.80	12.60	10.05

Here we find a difference between No. 1 and No. 4 of six per cent., or six pounds of water more in every one hundred pounds; while the difference in butter-fat alone is more than 5½ per cent. Thus it will be seen that the man who is furnishing a quality of milk like No. 1, is furnishing six pounds of dry matter (or of the material that goes to make cheese) in every one hundred pounds of milk, than No. 4, and 5½ pounds of this material is pure butter-fat. If the difference in the samples was confined simply to the *casein*, which amounts to only 37-100, or only about a third of a pound in the one hundred pounds of milk, it would be comparatively of trifling account.

Now, assuming for the moment that there is no waste in manufacturing, this six pounds of dry matter represented in cheese would be worth, at 10 cents per pound, 60 cents, while if expressed in butter, the 5½ pounds at 20 cents would amount to $1.10, a heavy loss on every hundred pounds of milk for the good dairyman, to be thrown into the pocket of the shiftless one. Under this system, what inducement is there for a dairyman to improve his herd in order to get a better quality of milk? Hundreds of men have said, and continue to say, "I do not care so much for *quality* as for *quantity*, that a cow yields, since water weighs more than fat at the factory, and the richer my milk the less credit I get." It is often said, too, that a cow is a good cheese cow, but is good for nothing for butter. How is this? Why not state the truth and say she is a good cow for making *skim milk cheese*; that she has the faculty of skimming her own milk, and therefore enables the dairyman to accomplish the feat of delivering skimmed milk at the factory without rendering himself amenable to the law. Rather small business even for a cow. Many people are misled in regard to the quality of milk

from the amount of cream it throws up; hence, in setting samples of milk in the cream gauge, erroneous conclusions are not unfrequently drawn from the percentage of cream indicated. Vœlcker analyzed four samples of cream, in which the butter-fat varied from 18 to 33 per cent., while the analysis of the other samples has shown that some creams contain over 56 per cent. of butter. The following table will show the variations in the richness of different creams, as expressed by ultimate analysis:

CONSTITUENTS OF CREAM.

	Water.	Solids.	Butter.	Casein.	Sugar.	Ash.
Mixed cream	59.25	40.75	35.00	2.20	3.05	.50
Country cream	49.00	51.00	42.00	4.20	3.80	.60
Jersey cream	36.40	63.60	56.80	3 80	2.80	.20
No. 1 cream	74.46	25.51	18.18	2.69	4.08	.59
No. 2 cream	64.80	35.20	25.40	7.61		2.19
No. 3 cream	56.50	43.50	31.57	8.44		3.49
No. 4 cream	61.67	38.33	33.43	2.62	1.56	.72
No. 5 cream	63.28	36.72	29.40	4.22	2.08	.40

Thus it will be seen that milk throwing up only ten per cent. of cream may contain more butter than that indicating from 25 to 30 per cent. of cream. But this is not the only difficulty to contend with. Milk that is agitated considerably in being carried to the factory does not so readily throw up its cream, and does not yield so much as when it is set immediately after being drawn from the cow, while, as is well known, some of the butter globules in all milk are so small that they never rise to the surface in cream under any circumstances. How, then, are we to get at the value of any sample of milk, without going to the trouble of churning, or subjecting it to a chemical analysis? It must be evident that if there was some simple device, which anyone could use with no more difficulty than the application of the lactometer, for determining the specific gravity of milk, and yet enable him to obtain a pretty close estimate of its real value, it would be a great desideratum. Such a device or process would be extremely useful, not only to the private dairyman who desires to test the milk of different cows, but especially useful to the factoryman, who buys milk, and who must regulate his prices according to the value of the product.

Instruments based on the principle of determining the quality of milk according to its degree of opacity have been invented from time to time, and although they gave pretty accurate results, still they were too complicated for the every day use of the dairymen, and have, therefore, remained in the hands of scientists or experts. Recently there has been invented in Germany an instrument that avoids all these complications, and is so simple in its construction and application that any ordinary person can use it, and determine in a few moments the percentage of butter in any sample of milk with considerable accuracy, sufficient at least for all practical purposes. In order to understand the principle upon which it works, it will be necessary to allude to some of the physical and chemical qualities of milk. In the first place it must be born in mind that in the composition of genuine cow's milk, the variation is chiefly in the two constituents, butter and water. Of the other constituents, the casein, the milk-sugar and the mineral matters, the relative proportions in any two samples are quite constant. Dropping out the milk-sugar and salts as unimportant so far as they enter into the composition of butter and cheese, we find that the variation in the single constituent, casein, will not generally be more than one-half of one per cent. Again, the butter globules are not held in solution in the same way as the casein. They are minute particles of fat floating through the liquid, and the color and opacity of milk are both due in a great measure to their presence. As these globules are separated in the shape of cream, the milk becomes clearer and acquires a peculiar bluish tint, which is a very good indication of its character. The less transparent milk is, the better, and more butter it contains.

Now, the new German lactoscope is constructed upon this principle, that is to say, of measuring the comparative opacity of milk and thereby determining its richness in cream globules or fat. It consists simply of a graduated wide glass tube somewhat smaller at the closed end, and with an opening at the other end, which can be stopped by placing the thumb upon it. Now, within this tube, at its lower or smaller end, is fused in, a small cylindrical tube of white glass, on which are marked black lines, and these lines become invisible when milk is poured into the instrument. By diluting a measured quantity of milk with water, the black lines become visible, and, according as the milk is more or less rich in

butter, the more or less water is required in order that the black lines may become visible. In the practical operation of this instrument for testing the quality of milk, all that is required is to pour into the graduated tube a measured quantity of milk (four cubic centimetres), and for this purpose a pipette comes with the instrument, which measures the exact quantity, and by which the milk may be drawn up and allowed to flow into the lactoscope. Common spring or well water is now added by degrees to the milk in the lactoscope, and well shaken up, so as to secure a perfect mixture, and the addition of water is stopped as soon as the black lines on the cylindrical tube become plainly visible. The figures on the right side of the lactoscope measuring the height of the fluid are so graduated as to tell at once the percentage of pure butter-fat in the milk. In 1879, Vœlcker made a number of experiments with this lactoscope on whole milk, skimmed milk, and watered milk, comparing the results with those made by chemical analysis. In some he found certain discrepancies, and especially when skimmed milk was well on toward acidity; and he remarks that when skimmed milk turns slightly acid, it becomes more opaque than when in a fresher condition. The sample of milk received by him from Sir Henry Dashwood, on the 31st of July, 1879, was analyzed on the same day and also tested with the lactoscope. It gave the following results:

COMPOSITION OF THE MILK BY CHEMICAL ANALYSIS.

Water	86.85
Pure butter-fat	3.80
Casein curd	3.00
Milk-sugar	5.56
Mineral matter (ash)	73
Specific gravity at 20.6° C. (69.08° Fahr.)	1.032
Percentage of cream by volume after standing 24 hours	5.000
Butter-fat indicated by lactoscope	3½ to 3¾ per cent.

He remarks that the preceding analysis represents fairly the average composition of *good*, *genuine*, *country milk*. The milk was sent by rail in a small tin only half filled, and evidently had been shaken about a good deal before reaching him, which accounts for its throwing up only five per cent. of cream, although it contained nearly four per cent. of butter-fat. In this milk the lactoscope showed three and one-half to three and three-fourths per

cent. of pure butter-fat, which agrees closely with the actual proportion of fat as determined by chemical analysis. After the addition of ten, twenty and thirty measures of water to one hundred measures of the same milk, the following results were obtained:

	MILK WITH —		
	10 per cent add. water.	20 per cent add. water.	30 per cent add. water.
	Per cent. butter-fat.	Per cent. butter-fat.	Per cent. butter-fat.
Lactoscope indicated	3	2½	2¼
Specific gravity 21° C. or 69.8° Fahr.	1.030	1.027	1.025

In this case the lactoscope indications were satisfactory, and he remarks the admixture of water in any considerable degree is at once detected by the lowering of its specific gravity, which, in genuine, good milk seldom falls below 1.029 or 1.028. The skim milk from the same sample, on analysis gave the following results:

COMPOSITION OF SKIM MILK.

Water	87.50
Butter-fat	2.86
Solids, not fat	9.64
Total	100.00
Ash	.720
Specific gravity at 20° C. (68° Fahr.)	1.034

The lactoscope indicated two and one-half per cent. of butter-fat — a result agreeing very well, he says, with the real amount of fat in this sample. Diluted with ten, twenty and thirty per cent. of added water, the same skim milk, when tested with the lactoscope, gave the following results:

	SKIM MILK DILUTED WITH —		
	10 per cent add. water.	20 per cent add. water.	30 per cent add. water.
	Per cent.	Per cent.	Per cent.
Lactoscope indicated per cent. of butter-fat	2 to 2¼	1¾	1½
Specific gravity at 21° C. (69.8° Fahr.)	1.032	1.029	1.027

In these experiments both the lactoscope and hydrometer showing the specific gravity were satisfactory. It will not be necessary to give results of other experiments made by Prof. Vœlcker, some of which showed more or less variation by the lactoscope, than was indicated by chemical analysis; but it will suffice to quote his words in summing up results of his experiments with the lactoscope. He says: "Reviewing the preceding experiments it will appear that although Feser's lactoscope does not give, in all cases, quite accurately the amount of butter-fat in milk, and shows certain discrepancies when milk is not quite fresh, it is nevertheless a very useful instrument for practical use. In most cases it shows without much trouble, in a few minutes, an approach to the real proportion of butter-fat in milk. Sufficiently near to enable an observer at once to form a pretty good estimate of the comparative richness of different samples of milk, and in conjunction with the specific gravity test to ascertain with certainty, whether milk is genuine new milk or watered milk; and whether milk has been partially or wholly skimmed, and at the same time whether it has been adulterated with much or little water.

He therefore recommends it to all persons interested in dairy matters.

TESTING MILK FOR WATER, A NEW METHOD.

A new test for finding whether milk has been watered has been furnished by a German chemist. It is very simple and can be applied by anyone. All that is required is a small quantity of plaster of Paris, say an ounce. This is mixed with the milk to a stiff paste and then allowed to stand. With milk at 1.030 specific gravity and a temperature of 60° Fahrenheit, he says it will harden in ten hours; if 25 per cent. of water is present, in two hours; if 50 per cent. in one and one-half hours; and with 75 per cent. in thirty minutes. Skimmed milk which has been standing for twenty-four hours is of 1.033 specific gravity, sets in four hours; with 50 per cent. of water, in one hour; and with 75 per cent. in thirty minutes. Heat should not be applied, as then the use of the thermometer would be required.

I made a few experiments with this method recently, and found that the plaster took a much longer time to harden when full milk was used than when watered. The milk used was very rich in butter-fat, and the time required to harden the paste was considerably

longer than that above named; but the time varied in proportion to the amount of water added to the milk, and I am of the opinion a rule may be made for testing milk for water by this means, and it certainly has the merit of being very simple and not costly.

THE AROMA OF FINE BUTTER AND CHEESE.

Prof. Segelcke, of the Royal Agricultural College of Denmark, whose experiments and investigations in dairy practice have been of such great value to that country, expresses the opinion that the aromatic principles of butter are due to the partial decomposition of milk or cream, and the development of lactic acid. In precisely what way this decomposition or development of lactic acid gives rise to the aroma in butter, so much sought after and admired by the lovers of butter, is not yet known, but it may and probably does come from chemical changes in utterly inodorous principles. He says:

"If the temperature of the milk when set for cream be from 10 to 12 degrees centigrade (50 to 54 degrees Fahrenheit) or more, it decomposes, forming lactic acid and several other new principles, among them aromatic principles, and it needs but to churn the cream to obtain aromatic butter. If on the other hand the temperature of the milk at such time be near the freezing point, the decomposition necessary for the production of aromatic principles is held in check, and consequently the aroma of butter obtained from fresh cream is so feeble that it is not perceptible to persons accustomed to butter prepared as above indicated — in the same way as French butters are made at present. But if it be desired to obtain a more aromatic butter, all that is required is, to place the cream in circumstances favorable to lactic fermentation, and a few hours will produce the required result. In either case, the aroma formed may be more or less agreeable — *that* all depends on the fundamental principles of the milk, on the quantity of the principles necessary for the formation of aromatic principles that is present, and on the method of manipulation employed. In either case, again, the appearance of aromatic principles is accompanied by that of lactic acid. Whether the aromatic principles sought for in butter are produced by lactic fermentation, by a simultaneous general fermentation, or by several fermentations combined, I do not know."

Prof. Segelcke then asks the question, "What is the chemical

composition of the aromatic principle so much admired in butter?" He says that to solve this interesting question, elaborate experiments would be required, and in conclusion he sums up the matter by saying that this at least is certain: "that without decomposition there is no aroma — at least no aroma in the ordinary sense of the word."

The question here raised is an important one in its relation to dairy manufacturers, especially in cheese making, where it has been found that the flavor so much admired, which cheese mongers express by the word "nutty," or "clean, sweet, nutty flavor," is in its best estate the result of developing lactic acid in the curds.

Before the inauguration of the cheese factory system, when cheese was made upon the farm, the general opinion prevailed among the best and most experienced cheese makers that a better flavored cheese came from milk having some age — at least twelve hours old — and that in the then method of manufacture (a kind of sweat process) a finely flavored cheese of the best sort could not be made from milk drawn directly from the cow. This principle has been very clearly demonstrated by the Cheddar dairymen of England, who develop lactic acid in their curds, and whose cheese has long been sought after as the best sort made in England, commanding the highest prices. Of course this development of lactic acid must not be carried too far, since it is then more or less destructive to the aromatic principles producing fine flavor, and it is on account of developing acidity too far that many cheese makers fail to accomplish the highest results, both as to flavor and mellow texture of their cheese. It is a curious fact in science that some of the most delightful flavors and perfumes are brought about from chemical changes or partial decomposition in products not particularly pleasing to the taste or smell. The bitter substance of salicine, which is largely extracted from willow bark, can, by a peculiar process, be converted into a fragrant essence. By another simple process this salicine is converted into salicylic acid, and salicylic acid, when combined with wood ether, forms oil of wintergreen. A compound of vinegar with potato ether gives the essence of Jargonelle pears. Potato ether is prepared by distilling potato spirit with oil of vitriol and acetate of potash. This ether, when pure, has a peculiar fruity smell, and when mixed with six times its bulk of spirit of wine, it acquires the peculiar pleasant odor and flavor of

the Jargonelle pear. Apple oil is a compound of the same potato or amylic ether with an acid known to chemists by the name of valerianic. The pure ether when dissolved in five or six times its bulk of alcohol has a most agreeable flavor of apples, and is largely employed by confectioners. Grape oil and cognac oil are also compounds of the amylic or potato ether with acids.

They are used for giving the desired cognac flavor to inferior brandies. Pine apple oil is common wine ether combined with butyric acid and then dissolved in alcohol. One mode of preparing the ether is to make butter into a soap, and to distill this soap with alcohol and sulphuric acid. The essence of quinces is obtained by distilling oil of rue with diluted nitric acid; when dissolved in alcohol it possesses in the highest degree the agreeable odor of the oil which is extracted from the peel of the quince. Formic and hippuricacids, each yield, when united with the wine and wood spirit ethers, very agreeable perfumes. Formic acid is the acid of ants, but it can also be formed artificially. The hippumic acid is extracted from the drainage of stables. Prof. Johnson gives a long list of those sorts of transformations brought about by different acids; he remarks that "this history of the odors we enjoy illustrates in a remarkable manner how out of the most vile materials, chemistry by its magical process can extract the sweetest and most desirable substances." It is well known that the development of lactic acid in cheese making is a means of covering up and keeping down disagreeable taints; but the manner of its action, whether it be in developing with more force aromatic principles or in killing the disagreeable taints in some way, has not as yet been fully explained. I give these facts to show that good cheese does not result simply in separating a certain percentage of water from sweet milk, as some have supposed, but that certain changes must be brought about in the union of the different constituents of milk, and that the proper development of lactic acid in the curd is among the first and most important of these. The effort to disguise the operation of acid in the curds under the name of a "cheesy smell," or "cheesing," is only a mystification of the art of cheese making likely to lead many astray. Cheese makers should have a knowledge of lactic acid, and be taught how to use it properly and not to misuse it, for when rightly used it becomes an important aid in the hands of the cheese maker for producing a

highly flavored, rich, long-keeping and highly appetizing product. This the Cheddar dairymen of England have proved over and over again during an experience of over two hundred years.

Prof. Sheldon, in his book on "Dairy Farming," now going through the press, gives the following sensible comments on this question: "It is obvious that incipient decomposition, which is but another term for ripening, develops the flavors which we do so much admire, and it is equally obvious that these pleasant flavors become unpleasant after a time, as decomposition proceeds. Thus it follows, that a given degree of acidity is useful in both cheese and butter making, developing as it does the flavor and aroma; but if it is allowed to go too far it destroys both of them, or rather carries them into a stage in which they are no longer attractive to the palate. The introduction of extraneous matter also may easily induce a sort of fermentation or decomposition which will develop aroma which is foreign, or may prevent the development of that which we should naturally expect to find in a well ordered article." In conclusion, the importance of cleanliness in all the details of dairy practice cannot be too strongly urged. Milk is a compound body, and the dairyman has enough to tax his powers in treating a substance composed of so many constituents differing from each other in character. If filth, or any other foreign decomposing matter, be added as another element, the substance becomes still more complicated, and it is not easy to tell what new compounds will result from a union with this extraneous matter to depreciate or spoil the product; and then another consideration of a sanitary nature is involved in this question of cleanliness. Filth and its products of decomposition may result in poisons more or less virulent, for it is from this source, it is believed, comes that subtle poison sometimes developed in cheese, the nature of which is so difficult to fix by chemical analysis.

EXPERIMENTS TOUCHING THE DIGESTION OF CHEESE.

A question has been raised concerning the digestibility of certain kinds of cheese, and the theory set up is of such a character as would seem to demand some correction. A year or two ago, a series of experiments, it is alleged, was made with different kinds of cheese, or cheeses made by different processes, by steeping portions in pepsin, to which had been added hydro-chloric acid, to

imitate the gastric juice of the human stomach; and the time required for dissolving the several portions of it is claimed to indicate the degree of digestibility.

On these experiments, it is claimed that cheese made by the development of lactic acid in the curds is less digestible than cheese made without an acid development, and further, that acid impairs the action of rennet on gastric juice. If this be so, are we to understand that acid fruits, and drinks like lemonade, or foods made acid with vinegar, etc., are indigestible and injurious?

The experiments referred to for obtaining a standard for the digestibility of different kinds of cheese I regard of little or no value, and the conclusions which have been drawn from them are liable to mislead, because it is assumed that the whole process of digestion is due to the gastric juice in the stomach. Indeed, the idea of measuring the digestibility of foods by this means, or taking the result of such tests as a *standard of digestibility*, has long since been exploded by physiologists. Putting food through an artificial process to simulate digestion, and going only half as far as it is carried in the living organism, is not likely to give very reliable conclusions. In the first place, the process of digestion commences in the mouth, by mastication, mixing the food with saliva, which is alkaline in its reaction, and breaking it down into a pulp. After entering the stomach, it is further affected by motion, and the heat rises to 100 degrees while the gastric juice is being poured upon it.

But some substances, such as oil, fat, starch, etc., are not acted upon by the secretions of the stomach. They pass on to the intestines, where the secretions of the liver, pancreas and other organs reduce them to conditions of assimilation and complete the work of digestion. Numerous experiments have been made from time to time to determine the part played by gastric juice in digestion, such, for instance, as inclosing food in perforated silver balls and introducing them with a string attached into the stomach, and then withdrawing them by means of the string. In these experiments it was found that certain kinds of food previously masticated were affected by the gastric juice, while if not so masticated they were not affected in a given time. Beaumont studied the digestion of food for a long time under extraordinarily favorable conditions. His examinations were made through an opening in the stomach of a Canadian lad, San Martin. This young person had received a

charge of buckshot in the left side which carried away the integuments and muscles to the size of a man's hand, fracturing and removing the anterior half of the sixth rib, fracturing the fifth, lacerating the lower portion of the left lobe of the lungs and the diaphragm, and perforating the stomach. A year from the date of the accident the injured parts were all healed with the exception of the perforation leading into the stomach, which was about two and a half inches in compass, thus giving opportunity of seeing the action of food taken into that organ. Beaumont has made record of his observations on different foods in the stomach of this person, and these investigations attracted much attention at the time, but they did not solve the problem of digestion. Prof. Draper, of the University of New York, in his work on "Human Physiology," a work recognized as standard authority, says in reference to this matter as follows:

"Statements respecting the digestibility of different articles of food *must, however, be received with many restrictions.* If, as the earlier physiologists believed, the stomach was the sole digestive cavity, and the intestines only for the purpose of absorption, *then* doubtless they might be much nearer the truth. But when we recall the well known fact that the digestion of fats *does not even begin* until the intestine is reached, and that the digestion of the nitrogenized substance is only *in part accomplished by the gastric juice*, but goes on under the influence of the intestinal juice *throughout the whole length of the small intestine*, we see at once how imperfect and *even incorrect* are the indications afforded by all such experiments as those of Spallamzani, who introduced food articles into the stomach through the œsophagus in perforated silver vessels, or those of Beaumont, who availed himself of a gastric fistula. Neither can we take, in all the instances, the time which an article of food will remain in the stomach, as a measure of its digestibility, for this is known to vary with many conditions, as for instance the quantity introduced at a time, and the condition of the organ itself." Again he says: "The experiments which have been made on the digestibility of vegetable food introduced through the gastric fistula, are obviously of no use whatever; since the chief constituents thereof, such as starch and fat, are not even influenced in those circumstances until they have reached the intestine. Their passage from the stomach in this unchanged

state, or changed only so far as their nitrogenized ingredients are concerned, may teach us the important fact which in these inquiries should be always borne in mind, that the disappearance from the stomach is one thing and digestion another. And that even though a substance may have passed the pyloric valve, its digestion, far from having been completed, *may not as yet have commenced.*"

If the views of modern physiologists are correct, the pepsin experiments referred to cannot be taken as a standard for the digestibility of cheese, for as fat, an important element in good cheese, is not acted upon by pepsin, or gastric juice, it would follow that whole milk cheese would be indicated as more indigestible than one made of skim milk, which the experience of consumers does not verify. The statement that acids in a mild form impair the action of gastric juice, and therefore cause all acidulated foods to be indigestible, is too ridiculous almost to require comment. If this were so, all acid fruits, acidulated drinks, and foods seasoned with lemon juice or vinegar, would prove unwholesome on account of their indigestibility. On the contrary, we find such foods very grateful and often essential, especially in hot weather. Fresh butter-milk, in which there is a development of lactic acid, has always been considered a healthful article of food, and this is proved by people who are accustomed to its use. One of the characteristic features of gastric juice is its acidity. Many eminent chemists maintain that the real agent in the solvent process is *free lactic acid*, while others are in favor of *free hydrochloric acid.* The idea that the development of lactic acid in the curds in cheese making serves to check the action of the rennet while the cheese is curing, and therefore makes the cheese more indigestible than a so-called "sweet-curd cheese," is not borne out by facts. And it must not be assumed, because a cheese is made on the acid plan, that it contains more acid when ripe for eating than cheese made up sweet or without the development of acid. Analysis shows that the so-called "sweet curds" contain or retain the most acid in the cheese. Vœlcker's analysis of Mr. Harding's Cheddar cheese, made on the plan of developing acidity in the curds, showed, when ripe, less than one per cent. of acid (96-100), while the Cheshire and Gloster cheese, made on the no acid plan, showed from five to six per cent. of milk-sugar and lactic acid, and both of these cheeses were inferior to the Cheddar. The claim, there-

fore, that acid is injurious on the theory set up would apply with much more force to "sweet curds" than to Cheddar. Dr. Chas. Richet, in a paper before the French Academy of Sciences, in which he treats of the acidity of the gastric juice in man, sums up his investigations with the following points:

"1. The average acidity of the gastric juice, whether pure or mixed with food, is equal to 1.7 grammes of hydrochloric acid per 1,000 of liquid. It has never been observed to be higher than 3.2 or lower than 0.5. 2. The quantity of liquid contained in the stomach exercises no influence on its acidity, which remains nearly invariable, whether the stomach is empty or filled with aliment. 3. Wine and alcohol increase the acidity of the stomach; cane sugar diminishes it. 4. If acid or alkaline liquids be injected, the gastric ones tend rapidly to resume their normal acidity, so that about one hour after the injection the stomach has regained its average acidity. 5. The gastric juice is more acid during digestion than after. 6. There is a slight increase of acidity toward the end of digestion. 7. The sensations of hunger and thirst do not depend either upon the state of acidity or on vacuity of the stomach. Meat stays in the stomach three or four hours. Milk is digested in the course of an hour and a half. Water and alcohol are absorbed in thirty-five to forty minutes. Food is not transmitted to the pylorus successively but all in a block." In conclusion it may be remarked, that the assumption that a proper development of lactic acid in cheese making, or in acidifying cream for butter making, must be injurious to these products, is one of those *merely speculative theories* which every day experience as well as science has proven to be without foundation. Rapidity of digestion depends so much on the quality and quantity of food, the state of health, the condition of the mind and the habits of exercise, that it is difficult to determine the relative digestibility of different articles of diet. Hence, the fallacy of setting up a standard from experiments with artificial solvents like pepsin and hydrochloric acid. And finally, if the addition of acid to pepsin is necessary for its efficiency, it is not easy to see why a proper development of lactic acid in cheese making should check the action of rennet and make the product indigestible.

DAIRY PATENTS AND ROYALTIES.

The dairy business is now pretty well covered over with patent

rights. Nearly every implement and appliance, besides some of the processes of manufacture, are loaded down with patents. A dairyman must now "look sharp" how he makes his cheese and butter, and uses his butter-milk, or he will be fastened with a royalty. Town people who enjoy a "bite of good cheese" have little idea of the manifold patents now employed in the production of this simple article of food. Let us enumerate some of them: The patent milking stool; patented pail for milking; patented strainer for straining the milk; patented carrying cans; patented scales for weighing the milk; patented dumping cans; patented milk vats and patented heaters; patented agitators and patented coolers; patented rennet and coloring extracts; patented curd knives, for cutting the curd; patented curd mills, for grinding the curd; patented hoops and patented presses; patented bandage and a patented appliance for putting them on the cheese. These are a part, and there are also innumerable patents surrounding the butter-maker. One may well ask, "Where is this numerous list to end?" Perhaps the dairyman appreciated the situation when he answered this question by saying: "They have got a patent machine for holding the cow's tail while milking, and I guess they will soon plaster a patent on the old cow, so she will have to be mighty careful how she makes her milk to escape paying royalty." It is often claimed, especially by those interested in selling patent implements, that the march of progress is aided and pushed on rapidly, from the fact that governments protect inventions. Do away with "letters patent," they say, and progress receives a check, since no one will be induced to spend his time and brain in bringing out inventions, unless with the hope of having an exclusive right in this kind of property. If there be truth in the assumption it hardly applies in full force to the dairy. Jesse Williams took no patents for the factory system which he originated and brought out. His vats and their appliances for steam, his conveying and dumping cans, his screw presses, together with the various implements peculiar to this system in its infancy, he gave to the public unincumbered with royalties. Mr. Young, of Herkimer county, who invented the gang curd knife for cutting the curds — a great improvement over the old system,— took out no patent. Mr. Slaughter, of Orange county, who first originated the creamery or butter factory system, setting

the milk in deep pails surrounded with cold spring water, who devised the cone shaped dipper for taking off the cream, who combined butter and skim-cheese making, and showed how they could be operated at one establishment with success, never thought of hampering his inventions with a patent. Swartz, the Swede, who discovered the ice method for getting the cream, and Mr. L. S. Hardin, who first brought out the refrigerator box as adapted to the Swedish plan of setting milk, had no patents. At the early conventions, factorymen and those interested in dairying met together for mutual improvement, and every one who had discovered a labor saving appliance or a new method in manufacturing was glad to make it known to his brother dairymen, and was invited to use it freely. Now the conventions are used as the best place for introducing and seeing patent appliances, and eminent speakers, who are pecuniarily interested in these things, covertly discuss their merits on the platform, at the expense of the very dairymen who are expected to purchase the goods recommended. These facts are given, not for the purpose of depriving inventors of any credit justly due them, but rather for the purpose of showing that the real progress of the dairy business is not due wholly to patented inventions, as has been claimed. But again it may be said there is no class of men who appreciate inventions and improved appliances in their business more than the dairymen. They do not object to paying liberally for all such improvements, but after these have been once fully paid for, and have been fairly introduced, they do object to paying for them a second time, under the claim that they have been using an article that infringes somebody's patent. Some years ago, a device known as the "rack and turner," for holding cheese while curing, was largely in use, and several years after its general introduction, a claim was made on individual dairymen for its royalty as a patent. Many paid this claim because they did not feel able to contest the validity of the patent. After a time the claim was resisted by a man who had plenty of money to use in trying the merits of the case in the courts, and after a long and expensive suit at law the validity of the patent was set aside, or was not sustained.

Later a device in use with the Frasier gang-press got into extensive use among the factories. The gang-press was considered an improvement over the old screw press, and every one who bought

the Frasier press supposed he was buying a clean patent. It now appears, or at least the courts have decided after an expensive suit at law — that some part of the appliances used was an infringement on a certain patent, and so the factories are now compelled to pay royalties on an article which in the first instance was purchased at a heavy cost. Again, a simple arrangement known as a device for "moulding cheese in the bandage" has been largely introduced, but upon which it appears a patent had been granted, and heavy royalties are now demanded from those who have been using this appliance, and some have paid them. A good many dairymen, however, have the impression that the patent cannot be sustained, and they have combined together to contest any suit that may be brought against the members of the combination for said royalty. Unless a compromise is made, the question will doubtless be carried to the courts for decision, and its merits need not be discussed here. It will be seen, however, that from the frequency of these claims of late, dairymen are subjected to great annoyance, and they very justly ask that the patent laws be so amended as to relieve them. They say that the question of infringement on patents should be settled with the manufacturers or dealers in the article, and not be carried to the innocent user. The dairyman or farmer buys an article that is offered for sale, supposing it to be all right; he has no warning of infringement, and cannot be expected to spend his time and money looking up the validity of patents. If the article is an infringement, the maker or dealer ought to know of it, and as the profits accrue to him, it is his business to look up the facts in the case, and settle all claims, if valid, for royalties. No doubt there are patents wrongly granted, and which cannot be sustained, but there are few dairymen who care to go to the expense of testing such claims, and hence, rather than be prosecuted, he pays the royalty demanded.

They ought not to be subjected to this burden. If a man invents and brings out a good thing, it is quite proper that he have the benefit of a patent, but it should be his business to keep track of his property, and not allow manufacturers to infringe upon it, or dealers to sell such spurious goods. To keep quiet until the appliance is fairly introduced, and then go among the innocent users of the implement, demanding royalty, would seem to be an extension to his right of property further than necessary. A great

many patents are taken out upon inventions, which from some imperfection utterly fail of success. They fall dead upon the public and are forgotten. After a time some one brings out a useful and popular machine, some parts of which may be covered by the aforesaid patent, and thus royalties are acquired, which often prove of great annoyance to the innocent users. The question of dairy patents has now become one of deep interest to dairymen, and if something is not done to amend the present law the "royalty business" bids fair to develop into a first-class nuisance to dairymen.

PATENT PROCESS FOR ADULTERATING DAIRY GOODS.

I have alluded to patent processes for making butter and cheese. These now threaten to inflict mischief upon the dairy industry of the country, and unless something is done to protect the honest manufacturer of genuine goods, the whole dairy interest of America will soon be regarded at home and abroad with distrust, stigmatized as an infamous fraud, all our dairy products being suspected of contamination with oleomargarine and hog's lard. Oleomargarine, or beef suet butter, has been of late so improved in manufacture that it passes with many for genuine butter, and when it is carefully added to cream and milk in churning, it can be made into an adulterated butter so perfect as to deceive even the elect. I am informed that large quantities of oleomargarine are now used to adulterate genuine butter, and that the business is very lucrative.

But this is not all. The western people, not content with beating our Yankee farmers in growing corn and wheat, and in sweeping off first premiums on genuine butter at our dairy fairs, must now needs call to their aid the hog, in order to outdo us in artificial butter frauds. Sueine caps the climax in butter shams, and is in the opinion of many a decidedly "hoggish affair." Why, it is getting to such a pass that a fastidious person hardly dare touch butter outside his own dairy for fear of catching trichina or hog cholera. "Root, hog, or die," says the poet, and it is significant of the times. Not long since an honest old farmer inquired concerning the process of making oleomargarine butter. He had a couple of old farrow cows giving milk this winter, and wanted to market three or four tubs of butter per week. "They are using," he said, "this article right here in town, and some prefer it to genuine butter." Yes, I know, and then I referred him to that case of Gilhooly recently re-

ported in the Mark Lane Express. Gilhooly strolled into his grocer's establishment one day, just as that distinguished statesman was opening a keg of golden tinted oleomargarine. "That looks nice; it's genuine butter, I suppose, none of your bogus stuff?" queried Gilhooly. Now this was a leading question. The grocer wanted the worst to sell some of that oleomargarine to Gilhooly, so he spoke up at once, "Of course it is butter; just look at the beautiful golden hue only found in dairy butter; it makes one think of cows and buttercups just to look at it, don't it now?" "But it is *butter?*" "Is it *butter?* Why of course it is. Some people are so suspicious, they won't believe butter is butter unless they take it out of the churn themselves. Man alive! Just smell it. Don't it make you think you are rolling in new mown hay? You can just taste the buttermilk, if you try." "But is it butter?" He had to lie, or lose a customer. When that issue was squarely put, it would have been a commercial suicide to have hesitated. So he came right out like a little man, and said it *was* butter. "Butter from cow's milk?" "Yes." "Then," said Gilhooly, as a sad smile passed over his features, "then I don't want it; cows' butter is no longer fashionable. I wanted some of the oleomargarine, made, you know, of axle grease, second-hand tallow and mucilage; that *looks* like butter, but contains organisms of a new kind of tape worm. I don't say I like that kind of jelly, but I am going to keep up with the procession anyhow. So you haven't got any oleomargarine? Sorry, for I thought you kept a first-class establishment." And he passed out like a beautiful dream.

The grocer was silent for a moment, and then he whispered confidentially to himself, "Next time I'll tell the truth, if it bursts me wide open."

THREE PROCESSES FOR MAKING SKIM CHEESE.

A few years ago three processes for making skim cheese were patented. One was the Arnold-Ellsworth process, a kind of joint invention of Prof. L. B. Arnold and Mr. Ellsworth. It consisted simply in adding the buttermilk to the skimmed milk, and agitating the mass in a churn before setting with rennet. The Vermont people protested that this buttermilk process was at least fifty years old, and the president of the Vermont Dairymen's Association affirmed that it had been in use by his grandmother and others

in her time. This process, however, did not amount to anything, and was practically abandoned, but I suppose it is yet good for royalties. Another patent was granted for improving skim milk for cheese making by the addition of oleomargarine, or any other other kind of grease, while a third patent consisted in adding the buttermilk to skimmed milk, and treating the whole to an alkali (potash), for breaking down and softening the casein of the milk. The inventors of this process, Messrs. Joslyn and Laraby, exhibited a cheese at a convention of the American Dairymen's Association in Utica, several years ago, which attracted much attention on account of its good flavor and apparent richness; but it has been said there were defects in the keeping qualities of the cheese. The last improvement recently brought out consists in uniting the grease patent with that last named, and adding an antiseptic to the alkali, the combination going under the name of the "anti-huffing and the anti-mottling extract."

By this process and the use of hogs' lard to supply the loss of butter, fat or cream extracted, it is a surprise to most cheese makers to see how closely a good whole milk cheese can be imitated from sour skim milk as a base. It is said these skims have sold the past season for nearly as much as whole milk goods, and a large number of creameries and factories, I am informed, have been induced to go into the manufacture next summer. Now all these products from the hogs' fat butter to the hogs' lard cheese are claimed to be legitimate, aye, even a benefaction to consumers, since they are claimed to be more appetizing to the palate than the poorer sorts of genuine butter and cheese, while at the same time they can be afforded cheaper. This is one side of the question. But on the other hand, the honest makers of the genuine article say they cannot compete with spurious goods sold in the market *as genuine* or whole milk, and therefore that the whole milk dairymen must be either forced to the wall or compelled to fall into the same line of spurious makers. And again, they affirm that our good name abroad will be jeopardized and our foreign trade will soon be so affected by distrust of spurious products as to render American dairying a by-word for fraud, and thus make it unremunerative.

Again, consumers complain that they are deceived in their purchases; that there is a reasonable doubt as to the healthfulness of these spurious products, and therefore a distinction should be

made by branding the adulterated article for what it is. This seems no more than fair and reasonable. Let the goods go to consumers on their own merits, and so branded that no one can be deceived. If they are so desirable for their excellence (as is claimed by the holders of the patent right), then surely there is no need of selling the goods under false names. And to meet the requirements of the whole dairy interest of America, a law passed by the general government is needed to cover these new developments in dairying.

The whole dairy industry of the country is interested in this matter. Let all spurious butters be branded and sold as such. Let every spurious cheese be plainly and conspicuously marked on its bandage and its box for what it is, and let makers and dealers be compelled to sell all spurious goods for *what they are*, under penalties of confiscation, fine and imprisonment, in the same manner as the English laws protect against the adulteration of foods. In this way our dairy industry may be rescued from threatened calamity.

QUESTIONS ASKED DURING THE READING OF HIS PAPER.

Q. What constitutes mixed cream?

A. It is the cream from different cows.

Q. What is No. 1 of the table?

A. Cream from a certain cow we had analyzed.

Q. Was there anything peculiar about that cow?

A. No, sir. All these cows were well fed and cared for in every respect. It was simply a cow that was taken from a herd just as if you would select one from your herd and take her cream and analyze it.

Q. Was there anything to distinguish it outwardly from the others.

A. I think not. Creams look very much alike, though they vary in butter fats. In the cream from a Dutch cow the butter globules are very small, and sometimes they will not rise at all. This instrument that I hold in my hand is called a *lactoscope*, and is used to measure the quantity of butter in milk. It has only been very

recently invented. I had this one imported from Europe, and it came just before I left home.

I wish to say right here that the Danes now make the best butter that is sent to England. Danish butter is quoted higher than any other butter made either in England or upon the Continent.

Every one claims to make the best butter, but it is the market that tells which is best. When your butter goes into the market, the butter that will bring the most money is the best. No individual taste — my taste is nothing, nor the president's. I don't care what his taste is. I am not going to take his taste. I want the market where I can get the most money. Dairymen are working for money, and I say that the Danish butter is far superior to any other. Since the cold system has been introduced into Denmark they have sent the very best butter to England that they can get. It is quoted to-day for more.

Ingalls — We charge the hog butter to New York.

X. A. Willard — Not the hog butter, oh, no! We will stand the oleomargarine, but we can't go the hog butter.

SYSTEMATIC FEEDING IN THE DAIRY.

By Prof. W. A. HENRY, Professor of Agriculture, State University, Madison.

While to the eye and the taste the number of food articles seems almost infinite, the careful research of chemistry shows that, after all, we have but three classes of substances, besides the mineral salts, which make up the plant structure, and afterward, upon entering the animal body, form parts of its structure. These three classes are the albuminoids, the carbohydrates and the fats. We must fix definitely in our minds the origin, characteristics and functions of each of these three classes of food substances before any real advance can be made in the subject of systematic feeding.

Let us consider first the albuminoids. We know that if we place an egg in proper conditions, a young bird will form within the shell, until in due time it occupies the whole interior. With no waste that we can observe, the contents of the egg has become flesh, bone, blood, down, etc. The contents of the egg shell, while consisting in reality of several compounds, after all was mainly albumen. We

may take the white of egg as the representative of albumen, though we find it in many other food substances, as in milk, where it exists as the casein. In the plant it is disseminated all through the growing parts, and is the most concentrated in the seed. The albumen of the various food substances is not always of quite the same composition, so that a broader term is often used, namely the *albuminoids*. Chemically the albuminoids are very complex compounds, in which the four elements, carbon, hydrogen, oxygen, and nitrogen are united. Sulphur accompanies the albuminoids, and may be a part of the compound. Closely allied to the albuminoids we find other nitrogenous compounds, but it is not within the province of this paper to enter into a description of them. Plants have the power to build up albuminoids from the elements taken from the soil and air, but it has not yet been found that any animal has this power, that is, the albuminoids of the animal structure must come as albuminoids from the vegetable food eaten by the animal whose system has the power to modify the albuminoids, but not create them. Let us get this fixed clearly in our minds. From the soil in which there is hydrogen and oxygen in the form of water; nitrogen and sulphur each in combination with some other element, and from the carbonic acid gas of the atmosphere, the plant has the power of bringing together these four elements, or five, if we include the sulphur, and so uniting them that they form one compound. This the plant can do, but not the animal, which to obtain them must find them already formed in the vegetable food or in the flesh of some animal.

The carbohydrates form the second great division in our food list. Under this head comes starch, cellulose or woody fibre, cane sugar, grape sugar, milk sugar, etc. Their chemical composition is much simpler than that of albuminoids, and they are made up of only three elements, namely, carbon, hydrogen and oxygen. As when forming the albuminoids the plant has the power to take chemical compounds from the air and earth, and separating out the elements just named, unite them to form the carbohydrates. The carbohydrates form the bulk of our fodders, as we would naturally suspect when we reflect that all woody fibre comes under this head, as well as starch and sugar.

The last of the classes, the fats, will receive but little attention here. Certain oils and fatty substances occur in the stems and

leaves of plants, but more especially in the seeds, as in corn, flax seed, etc. These, too, are compounded of the three elements, carbon, hydrogen and oxygen, as the carbohydrates, but with far less regularity of composition. In a paper like this, where only the main topics receive attention, the fats must be passed over with as little notice as possible. With these two classes, as with the albuminoids, the animal appropriating the chemical compounds already formed by the plant builds them into its body or breaks them down into simpler ones, but it has no power to create them from the simple elements.

Let us turn our attention next to the function or use of these classes of food. The albuminoids are of the highest importance in the animal economy, as they go to form muscle, nerves, tendons — the working machinery of the body. The carbohydrates and fats cannot do this, so that albuminoids are essential to the life of animals. In addition to the muscles, nerves and tendons of the body, the albuminoids in the body split up, and a part forms fat and a part uric acid, which leaves the body through the kidneys. In breaking up in this way, heat results. In general, we may call the albuminoids the *muscle formers*, since this is in main their first function. The carbohydrates cannot make muscle, nor is it certain that from them fat can be formed; but by their being burned up, the fat from other sources, which otherwise would be consumed, is saved. The fats taken into the body may form the fatty tissue of the animal; or, like the carbohydrates, may break up into carbonic acid gas and water. The carbohydrates and fats, then, may be styled the "fat formers," so that, so far as functions go, we have but two classes of foods, namely, the "fat formers" and the "flesh formers." Of the salts, such as phosphate of lime, sodium chloride or common salt, which are as essential as any other food constituent, we need pay no attention in our early efforts to study the subject. All the ordinary feeding materials contain enough of these, except common salt, to meet the wants of the animals, and, with this exception, we need make no provision for them by special attention.

We must look upon the animal, then, as taking into its stomach a variety of compounds which may be classed under the heads already named, and that these unchanged or but slightly altered

enter the circulation, and are built up into the body or are broken down, in which process the phenomena of life appear.

Having learned the functions of the albuminoids, carbohydrates and fats, we will next see how they are disposed of in our common fodders. Chemical analysis shows how many pounds of each of these exist in a given food, as for instance the chemist can tell exactly how many pounds of carbohydrates there are in a ton of wheat straw, or how many pounds of albuminoids in a ton of oil meal. The chemist, however, is able to get a larger amount of albuminoids or carbohydrates out of a fodder than the animal can obtain by digestion. Chemistry shows that corn, straw and wood are all mainly composed of carbohydrates, yet, we reason at once that an ox would get more of the carbohydrates out of a given weight of corn than from straw, while from wood fibre only animals of the strongest digestive powers, as the goat, could obtain some slight nourishment. We must distinguish between the total and the digestible constituents of each of our fodders. Let us begin now a study of the table given on page 88, and see if it does not contain facts of interest. Taking the first fodder in the list which is "inferior German meadow hay," we see that of 100 pounds, 14.3 pounds are water. To find this a weighed quantity of the hay from the mow is placed in an oven, which is heated to the temperature of 212 degrees. After remaining for some time in the oven, it is again weighed, and the difference between the two weights is the amount of water. Upon burning the hay the ash weighs five pounds. In the next column we find the amount of the albuminoids; then follows the fiber, carbohydrates other than fiber and fat in 100 pounds of the hay. These first six columns give results obtainable in the laboratory of the chemist. Now follows what the animal can do, as shown by the most careful analyses of the food and excrements of farm animals. Of the 7.5 pounds of albuminoids which exist in the 100 pounds of hay, we see by the seventh column, that only 3.4 pounds are digested, the rest being waste, and passing out of the alimentary canal as solid excrement; 34.9 pounds of the carbohydrates or somewhat less than half of all, are digested. Of the fat, just one-third or one-half pound enter the animal system.

To summarize then, of 100 pounds of this inferior hay the animal gets for use 3.4 pounds of albuminoids, 34.9 pounds of carbohydrates and .5 of fat, besides a small amount of mineral matter.

Now for an explanation of a phrase of great importance in this connection. The fat in fodder has been supposed by some to have more value than an equal weight of carbohydrates; and since the function of each is in the main to supply the body with heat, and a pound of fat in burning gives off two and one-half times the heat that a pound of starch does, the value of fat is placed at two and one-half times that of starch. If, then, we multiply the amount of fat given by two and one-half and add it to the carbohydrates, we can get the ratio between flesh formers and the fat or heat formers. This is the *nutritive ratio.* With the hay under consideration, we have of the digestible nutrient albuminoids, 3.4 pounds. Multiplying the five-tenths pounds of fat by two and one-half, and adding it to 34.9 pounds of carbohydrates, gives 36.15 pounds, and dividing the latter by the former gives 10.6, the nutritive ratio; that is, for every pound of digestible albuminoids in this hay there are 10.6 pounds of digestible carbohydrates. Dr. Wolff found that in Germany the average cost of the ordinary food for stock was such that each pound of digestible albuminoids will cost four and one-third cents, fats the same and carbohydrates nine-tenths of a cent per pound. With these prices allowed, this quality of hay was worth in Germany forty-eight cents per hundred pounds. This is shown in the last column but one of the table. The last column is more interesting and should be carefully consulted by every person who feeds stock. It is a comparative table with average meadow hay, which is probably equal to our best hay, as the standard. Calling average hay worth a cent a pound or one dollar per hundred pounds, we can get at the relative values of other fodders. Thus we find bran worth $1.63 per hundred pounds; not meaning that bran is really worth that, but only on the supposition that average hay is worth one dollar per hundred pounds. If hay is worth but half that, then we can afford to pay but half of $1.63 per hundred pounds for bran. It must be remembered that all these results are, with but few exceptions, from German experiments, and that the values of the food are those obtained by proper feeding.

AVERAGE COMPOSITION, *Digestibility and Money Value of Feeding Stuff as given by Dr. Wolff for Germany for* 1878, *except those in italic, which are from the Connecticut Experimental Station.*

(Copied from Connecticut Agricultural Report for 1878.)

	Water.	Ash.	Albuminoids.	Fiber.	Other carbohydrates.	Fat.	Digestible Nutrients.			Nutritive ratio.	Value.	
							Albuminoids.	Carbohydrates inc. fiber.	Fat.		Dollars per 100 pounds.	Comparison with meadow hay.[1]
Meadow hay, inferior	14.3	5.0	7.5	33.5	38.2	1.5	3.4	34.9	0.5	10.6	0.48	0.74
Meadow hay, better	14.3	5.4	9.2	29.2	39.7	2.0	4 6	36.4	0.6	8.3	0.55	0.86
Meadow hay, average	14.3	6.2	9.7	26.3	41.4	2.5	5.4	41.0	1.0	8.0	0.64	1 00
Meadow hay, very good	15.0	7.0	11.7	21.9	41.6	2.8	7.4	41.7	1.3	6.1	0.74	1.17
Meadow hay, extra	16.0	7.7	13.5	19.3	40.4	3.0	9 2	42.8	1.5	5.1	0.84	1.32
Clover hay, average	16.0	5.3	12.3	26 0	38.2	2.2	7.0	38 1	1.2	5.9	0.69	1.08
Clover hay, best	16.5	7.0	15.3	22.2	35.8	3.2	10.7	37.6	2.1	4.0	0.88	1.39
Timothy hay	14.3	4.5	9.7	22.7	45.8	3.0	5.8	43.4	1.4	8.1	0.69	1.09
Hungarian hay	13.4	5.7	10.8	29.4	38.5	2.2	6.1	41.0	0.9	7.1	0.66	1.04
Rye straw[2]	14.3	4.1	3.0	44.0	33.3	1.3	0.8	36.5	0.4	46.9	0.35	0.55
Oat straw	14.3	4.0	4.0	39.5	36.2	2.0	1.4	40.1	0.7	29.9	0.44	0.69
Rich pasture grass	78.2	2.2	4.5	4.0	10.1	1.0	3.4	10.9	0.6	3.6	0.27	0.42
Average meadow grass, fresh	70.0	2.1	3.4	10.1	13.4	1.0	1.9	14.2	0.5	8.1	0.22	.36
Green maize, German	85.0	1.0	1.2	4.7	7.6	0.5	0 7	7.4	0.2	11.3	.10	.16
Green maize, Mr. Webb, 1874	86.0	0.8	0.8	4.8	7.3	0.3	0.6	8.3	0.2	14.4	.11	.17
Cured maize fodder, Mr. Webb	27.3	4.2	4.4	25.0	37.9	1.3	3.2	43.4	1.0	14.4	.57	.91
Potatoes	75.0	0.9	2.1	1.1	20.7	0.2	2.1	21.8	0.2	10.6	.29	.46
Carrots	85 0	0.9	1.4	1.7	10.8	0.2	1.4	12.5	0.2	9.3	.18	.28
Mangolds	88.0	0.8	1.1	0.9	9.1	0.1	1.1	10.0	0.1	9.3	.14	.22

Rutabagas	87.0	1.0	1.3	1.1	9.5	0.1	1.3	10.6	0 1	8.3	.15	.24
Turnips	92.0	0.7	1.1	0.8	5.3	0.1	1.1	6.1	0.1	5.8	.11	.16
Sugar beets	81.5	0.7	1.0	1.3	15.4	0.1	1.0	16.7	0.1	17.0	.19	.30
Maize, German	14.4	1.5	10.0	5 3	62.1	6 5	8.4	60.6	4.8	8.6	1.10	1.73
Maize, American	14.4	1.5	10.7	2.0	66.5	4.9	9.0	63.3	3.7	8.0	1.12	1.75
Oats	14.3	2.7	12.0	9.3	55.7	6.0	9.0	43.3	4.7	6.1	.97	1.53
Rye	14.3	1.8	11 0	3.5	67.4	2.0	9.9	65.4	1.6	7.0	1.09	1.68
Barley	14.3	2.2	10.0	7.1	63.9	2.5	8.0	58.9	1.7	7.9	0.95	1.47
Peas	14.3	2.4	22.4	6.4	52.5	2.0	20.2	54.4	1.7	2.9	1.44	2.25
Field beans	14.5	3.1	25.5	9.4	45.9	1.6	23.0	50.2	1.4	2.3	1.51	2.36
Squashes	89.1	1.0	0.6	2.7	6.5	0.1	0.4	7.1	0.1	18.4	.08	.13
Malt sprouts	10 1	7.2	24.3	14.3	42.1	2.1	19.4	45.0	1.7	2.5	1.31	2.06
Wheat bran, coarse	12.9	6.6	15.0	10.1	52.2	3.2	12.6	42.6	2.6	3.9	1.04	1.63
Wheat bran, fine	13.1	5.4	14.0	8.7	55.0	3 8	11.8	44.3	3.0	4.4	1.03	1.62
Middlings	11.5	3.0	13.9	4.8	63.5	3.3	10.8	54.0	2.9	5.7	1.07	1.68
Rye bran	12.5	5.2	14.5	5.7	58.6	4.5	12.2	46.2	3.6	4.5	1.10	1.72
Palm nut cake	10.5	4.2	16.9	17.4	41.0	10.0	16.1	55.4	9.5	4.9	1.61	2.51
Cotton seed cake decorticated	11.2	7.6	38.8	9.2	19 5	13.7	31.0	18.3	12.3	1.6	2.05	3.22
Fish scrap by Goodale's process	11.5	.....	64.0	.....	.....	4.6	57.6	.....	4.1	0.2	2.67	4.17
Fish scrap, dry ground	11.7	.....	51.5	.....	.....	8.1	46.4	.....	6.2	0.3	2.28	3.56
Dried blood	12.0	4.1	80.8	.....	2.6	0.5	54.1	2.6	0.5	.....	2.39	3.76
Whey	92.6	0.7	1.0	.....	5.1	0.6	1.6	5.1	0.6	6.6	.11	.18
Milk	87.5	0.7	3.2	.....	5.0	3.6	3.2	5.0	3.6	4.4	.34	.53

[1] Nutritive ratios are read 1:10.6, 1:8.3, etc.

[2] Stover, that is corn fodder from which the ripened ears of corn have been removed, has about the same composition and worth as rye straw.

In estimating the value of the root crop, no account is taken of the often enhanced value of the food, owing to its succulence. We know that often human beings crave such food as apples, grapes, pears, etc., and the value of such cannot be computed from the amount of nourishment they give. The benefit derived from a few feeds of beets or rutabagas to a feverish animal may be of far greater value to it than a large amount of grain, though the latter might contain the most nourishment. Nor can the question of palatability be here decided. That can only be determined by the farmer who has both the stock and the feed before him. The values assigned are those for the various food articles, when they are so fed that all the nutritive elements are extracted by the animal. Thus the comparative high value assigned to straw is not that which straw has when fed alone, but when it is so fed along with other foods rich in albuminoids that all the digestible carbohydrates are extracted by the animal. Again, we must remember that the Germans are more careful with their meadows, and that our hay is inferior to theirs upon the whole, so that their average hay is probably equal to our best hay.

Carefully conducted experiments were instituted to ascertain how much of each of the food constituents are required to meet the demands of farm animals under their various conditions. Let us illustrate by taking the case of a full grown ox weighing just 1,000 pounds, and in good flesh and health, and kept in a good comfortable stall. How much food is required to keep this animal in just its present condition, neither growing fat nor lean? At first thought we might conclude that no muscle formers or albuminoids are needed, as no apparent work is done, but we should reflect that the animal must breathe, its heart contract many times a minute to send the blood over the body, that the stomach must labor in digestion, and that standing up means muscular effort. Our quiet ox, then, is really doing some work all the time, and to keep up these various processes .7 of a pound of digestible albuminoids must be supplied. Of the heat formers or carbohydrates 8 pounds must be supplied, besides .15 pounds of fat, any mention of which might be omitted, only that about that amount would probably be found in any of the ordinary foods supplied. Multiplying the .15 pounds of fat by 2½ gives .37 as the value of the fat in the food with carbohydrates as the standard; adding this to 8 pounds gives 8.37 pounds carbohy-

drates; now .7 goes into 8.37 nearly twelve times, and this gives the nutritive ratio 1 to 12. By this we mean that an ox under the above conditions named, requires for his sustenance twelve pounds of carbohydrates or fat formers for every one of flesh formers. The nutritive ratio for the ox at rest is 7:12. Perusing the tables for rations for farm animals on this and next page, we see these state-

FEEDING STANDARDS.

A. Per Day and 1,000 *pounds, Live Weight.*

	Total organic substance.	Nutritive (digestible) substances.			Total nutritive substance.	Nutritive ratio.
		Albuminoids.	Carbohydrates.	Fat.		
	lbs.	*lbs.*	*lbs*	*lbs.*	*lbs.*	
1. Oxen at rest in a stall	17.5	0.7	8.0	0.15	8.85	1:12.
2. Wool sheep, coarser breeds	20.0	1.2	10.3	0.20	11.70	1:9.
Wool sheep, finer breeds	22.5	1.5	11.4	0.25	13.15	1:8.
3. Oxen moderately worked	24.0	1.6	11.3	0.30	13.20	1:7 5
Oxen heavily worked	26.0	2.4	13.2	0.50	16.10	1:6.
4. Horses moderately worked	22.5	1.8	11.2	0.60	13.60	1:6.
Horses heavily worked	25.5	2.8	13.4	0.80	17.00	1:5.5
5 Milch cows	24.0	2.5	12·5	0.40	15.40	1:5.4
6. Fattening oxen, first period	27.0	2 5	15.0	0.50	18.00	1:6.5
Fattening oxen, second period	26.0	3.0	14.8	0.70	18.50	1:5.5
Fattening oxen, third period	25.0	2.7	14.8	0.60	18.10	1:6.0
7. Fattening sheep, first period	26.0	3.0	15.2	0.50	18.70	1:5.5
Fattening sheep, second period	25.0	3.5	14.4	0.60	18.50	1:4.5
8. Fattening swine, first period	36.0	5.0	27.2		32.50	1:5.5
Fattening swine, second period	31.0	4.0	24.0		28.00	1:6.0
Fattening swine, third period	23.5	2.7	17.5		20.20	1:6.5
9. Fattening cattle: *Age, mos.* — *Av. live wt. per head.*						
2– 3 ... 150 lbs	22.0	4.0	13.8	2.0	19.8	1:4.7
3– 6 ... 300 lbs	23.4	3.2	13.5	1.0	17.7	1:5.0
6–12 ... 500 lbs	24.0	2.5	13.5	0.6	16.6	1:6.0
12–18 ... 700 lbs	24.0	2.0	13.0	0.4	15.4	1:7.0
18–24 ... 850 lbs	24.0	1.6	12.0	0.3	13.9	1:8.
10. Growing sheep:						
5– 6 ... 56 lbs	28.0	3.2	15.6	0.8	19.6	1:5.5
6– 8 ... 67 lbs	25.0	2.7	13.3	0.6	16.6	1:5.5
8–11 ... 75 lbs	23.0	2.1	11.4	0.5	14.0	1:6.0
11–15 ... 82 lbs	22.5	1.7	10.9	0.4	13.0	1:7.0
15–20 ... 85 lbs	22.0	1.4	10 4	0.3	12.1	1:8.0
11. Growing fat pigs:						
2– 3 ... 50 lbs	42.0	7.5	30.0		37.5	1:4.0
3– 5 ... 100 lbs	34.0	5.0	25.0		30.0	1:5.0
5– 6 ... 125 lbs	31.5	4.3	23.7		28.0	1:5.5
6– 8 ... 170 lbs	27.0	3.4	20.4		23.8	1:6.0
8–12 ... 250 lbs	21.0	2.5	16.2		18.7	1:6.5

B — Per Day and per Head.

	Total organic substance.	Nutritive (digestible substance.			Total nutritive substance.	Nutritive ratio
		Albuminoids.	Carbohydrates.	Fat.		
Age, mos. *Av. live wt.* Growing cattle: *per head.*	*lbs.*	*lbs.*	*lbs.*	*lbs*	*lbs.*	
2- 3 ..... 150 lbs...	3.3	0.6	2.1	0.30	3.00	1:4.7
3- 6 ..... 300 lbs...	7.0	1.0	4.1	0.30	5.40	1:5.0
6-12 ..... 500 lbs...	12.0	1.3	6.8	0.30	8.40	1:6.0
12-18 ..... 700 lbs...	16.8	1.4	9.1	0.28	10.78	1:7.0
18-24 ..... 850 lbs...	20.4	1.4	10.3	0.26	11.96	1:8.0
Growing sheep:						
5- 6 ..... 56 lbs...	1.6	0.18	0.87	0.045	1.095	1:5.5
6- 8 ..... 67 lbs...	1.7	0.17	0.85	0.040	1.060	1:5.5
8-11 ..... 75 lbs...	1.7	0.16	0.85	0.037	1.047	1:6.0
11-15 ..... 82 lbs...	1.8	0.14	0.89	0.032	1.062	1:7.0
15-20 ..... 85 lbs..	1.9	0.12	0.88	0.025	1.047	1:8.0
Growing fat swine:						
2- 3 ..... 50 lbs...	2.1	0.38	1.50		1.88	1:4.0
3- 5 ..... 100 lbs...	3.4	0.50	2.50		3.00	1:5.0
5- 6 ..... 125 lbs...	3.9	0.54	2.96		3.50	1:5.5
6- 8 ..... 170 lbs...	4.6	0.58	3.47		4.05	1:6.0
8-12 ..... 250 lbs...	5.2	0.62	4.05		4.67	1:6.5

ments arranged in tabular form. In the first column is given the total organic substance, by which is meant the weight of the food as fed, less the weight of the water and ash it contains. By the table we see that the ox weighing 1,000 pounds when well cared for, to keep in the same condition of flesh, neither gaining nor losing, requires 17.5 pounds of organic substance. .7 pounds albuminoids, 8 carbohydrates, .15 fat, or total nutritive substance of 8.85 pounds per day, with nutritive ratio of 1:12. This is quite a different amount and proportion from that required by the fattening ox as shown by the same table. Consult now the table to ascertain what is required for the cow in full flow of milk, and we see that she requires a large quantity of food and an abundance of albuminoids.

By the aid of the two tables we are prepared to make up ration for our farm animals. Supposing that the farmer has good clover hay, corn fodder and bran, and wishes to calculate the feed needed by a cow, in full flow of milk, weighing 1,000 pounds, according to the tables. Suppose he concludes to see if twenty pounds of clover, five of corn fodder and eight of bran is a fair quantity. Let us cal-

culate by using the first table, and see if he is correct. Take the twenty pounds of clover and what will the cow extract from it? In 100 pounds 16 is water 5.3 is ash. In the 20 pounds taken, then, 4.2 is water and ash, leaving 15.8 pounds as dry organic matter. If there are 7 pounds of digestible albuminoids in 100 pounds, in 20 pounds there are 1.4 pounds. If 38.1 pounds of carbohydrates are digested out of 100 pounds, in 20 pounds there are 7.6 pounds, and of the fat, by the same reasoning, .24. Calculating for the corn fodder and bran, each in the same way, we are enabled to tabulate our results as follows:

FOOD GIVEN.	Dry Organic Matter.	DIGESTIBLE.		
		Albuminoids.	Carbohydrates	Fats.
Twenty pounds average clover hay	15.8	1.40	7.6	.24
Five pounds corn fodder	3.5	.15	2.1	.05
Eight pounds bran	6.5	1.00	3.6	.20
	25.8	2.55	13.3	.49
Standard	24.	2.50	12.5	.40

The standard is taken from the second table. We see that the ration is more ample in each particular than the standard requires, yet very near it; in fact, the error is on the right side of the account. After going over the table and studying how each of the results was obtained, I think any farmer who is willing to put a little study upon the subject can calculate rations out of such fodders as he has on hand or can profitably purchase with advantage. Here at the west, the carbohydrates are very cheap in the shape of straw and stover, while corn fodder grows with great luxuriance. Albuminoids in the bran and oil meal are cheaper than at the east. I am of the opinion that the material usually fed to our farm animals is too poor in albuminoids, and that the animal in eating its food, in order to get a sufficiency of this kind, takes into its stomach a much larger amount of carbohydrates than is necessary, which does not enter the system at all, and pass off in the excrement. With poor shelter for our farm stock in our severe climate, no doubt the amount of carbohydrate given in the table is too small, and allowance should be made on this account.

While the rations are usually too poor in albuminoids in winter, they may be too rich in summer. A case brought up at the German experimental station at Mœckern, Saxony, is in point: I quote from one of a series of articles on the subject of feeding, by Prof. W. O. Atwater, of the Connecticut experimental station, as given in the American Agriculturist several years since. He says: "The custom of feeding cows on green clover was common about Mœckern. But clover is very rich, while straw is very poor in nitrogen. How would it do to mix the two? Further, the question of *ad libitum* foddering (that is, giving the animals all they will eat) was much discussed. Some said the cows themselves were the best judges of their wants. Others claimed they would eat more of such palatable food, as clover, than they would profitably utilize. To test these questions a feeding trial was made with four cows. During one period of several weeks they received all the green clover they would eat. During another, a smaller ration was given, and a part of the clover was replaced by straw. The fodder and milk were carefully weighed and analyzed. Every precaution was taken to insure accuracy. The rations in the two periods were as follows:

	THE ORGANIC SUBSTANCE CONTAINED —	
	Albuminoids.	Carbohydrates.
	Lbs.	*Lbs.*
(I.) 87 lbs. green clover and 6.7 lbs. barley straw..	3.8	17.8
(II.) 123 lbs green clover.....	5.6	15.

"The result was that the cows gave as much milk, and milk as rich in fat (butter) and casein with the small ration (I), of which part was straw, as they did with the larger ration (II) of pure clover. The cost of the milk, as based upon the value of the fodder, was just about 50 per cent. more with clover alone, than with the mixture of clover and straw. The 3.8 pounds of albuminoids was sufficient, and in the pure clover, 5.6 pounds, there was a waste. Part of this waste was due to the *ad libitum* feeding, but part was due to the unnecessarily large amount of albuminoids in the green clover."

If there are any who have followed me thus far, let me say to them in closing, that I believe, even with our imperfect knowledge upon this subject, we can be benefited by a careful study of what is here set forth. Formerly all expertness in feeding stock died with the fortunate possessor of such knowledge; now we are studying for the broad underlying principles of this truly worthy calling, which are unchangeable, and which, when coupled with good judgment will bring forth no uncertain results.

I make no claim to originality in this production, but hope nevertheless that before many years our University Experimental Farm will be so managed that experiments upon Wisconsin farm products will give us more reliable data to work from than food tables originating in Germany. Much depends upon the position which our dairymen assume in this matter. If they are satisfied with present knowledge, it will be but tedious work; while if they are anxious for more light, which seems most plainly to be the fact, we will enter upon this work with enthusiasm.

To those who wish more light upon this subject, I gladly refer to Dr. Henry P. Armsby's "*Manual of Cattle Feeding*," published by John Wiley & Sons, New York. This book marks an era in American agriculture, and too much cannot be said in its praise.

The tables here used are copied from the report of the Connecticut Experimental Station for 1878. Too much credit cannot be given to Professor W. O. Atwater, director of that station, for the energy he has shown in advancing this branch of scientific education in America.

QUESTIONS ASKED DURING AND AFTER THE DELIVERY OF PROF. HENRY'S ADDRESS.

Q. Are these experiments made with Timothy hay?

A. No, sir; it is the average German hay, called meadow hay. These experiments are made in Germany.

Pres. Favill — You have left out of this table the most common feed among us — corn meal.

Prof. Henry — Of 100 pounds of Indian meal, a cow will digest 8½ pounds of albuminoids, 60 pounds of carbohydrates, and four pounds of starch, with a ratio of 1 to 8.

Pres. Favill — That is not a good proportion?

A. No, it is not, according to the theory, the best food to feed. There will be a loss of carbohydrates.

Prof. North — Suppose you feed a superabundance of albuminoids, will the cow's appetite for carbohydrates increase? Will there be a demand for this?

A. Yes; there is a demand for carbohydrates just the same as children cry for sugar, when old persons do not care for it.

Prof. North — Have you made any experiments of that kind at Madison?

A. No, I have not.

Prof. North — Do you intend to make any?

Prof. Henry — Regent Smith, of the university, is here, and I would rather have you attack him. He stands at the helm. I would say that I am through with the lecture, and will answer all questions.

Q. Your experiments were carried on with European meadow hay. Is it possible to make experiments with this hay to satisfy us?

A. I believe it is possible. No two men's hay is alike. What I have given you here is the average of a thousand experiments which have been going on twenty-five years.

Prof. North — We have done a great deal for the university, and have had very little from it. That is a fact.

Voice — We are getting something from it to-day.

Prof. North — Yes, I grant that, but I say that hitherto we have not.

Hiram Smith — Have you ever asked the Board of Regents to do anything?

Prof. North — We thought they knew what we wanted.

Prof. Henry — I would like to ask if you ever attended a convention of the association before?

Prof. North — I have read reports of the Regents of the University.

Hiram Smith — We have had Prof. Daniells before us twice. Besides that, the state published at public expense the report of the dairymen's convention, so that the university has been giving us something before this.

Prof. North — I am glad that they have. Only, I wish they had given it in a shape so that we could all get it.

Hiram Smith — It might require a ramrod.

Prof. North — Well, why didn't they use it. [Laughter.]

Hiram Smith — The game was not worth the rod. [Renewed laughter.]

Prof. Henry — I would like to read an article written by Prof. Atwater, who is always reliable. It is in one of my scrap books. I think it is the best thing for every man to keep a scrap book.

(He then read the article.)

Pres. Favill — I would suggest that Prof. Henry include that article in his remarks here, when he prepares them for publication.

Prof. Henry — I would gladly do so, and I am willing to enlarge upon this subject, and give a table including corn meal.

Pres. Favill — We would be very glad to have you do so.

Hiram Smith — I think the professor has struck a very important point for dairymen to consider. It is necessary that we have more knowledge upon the materials which we are feeding out to our cattle. We may waste a whole wheat stack for the want of knowledge of how to combine the albuminoids with the straw. Both are equally palatable, if mixed. The professor has been the first to give us a table.

Anybody who is desirous of learning, in this matter, can obtain a report by writing to Mr. Curtis, who is always ready to forward, free of expense, any of the reports. Now, it is for the farmers to wake themselves up and desire information, and show some disposition to appreciate and have some understanding, by which the University at Madison shall know the wants of the farming community.

The university is always willing to satisfy any earnest desire for information, in any direction.

But I say with shame that scarcely a farmer in this state has ever asked the university to do anything at all. They seem to take no interest. We find here that men of intelligence are not familiar with what has been done, in the slightest degree,— know nothing about the reports that have been made, or the amount of matter contained in these reports. They are thrown out, and many go to waste. There should be a united interest of the farmers at large, in the state, and they should form some intelligent demand or request, and then I have no doubt that entire satisfaction will be given to all reasonable demands.

Prof. North — I think that the agricultural community here to-day

are anxious to know the very best way to economize on the farm. It is natural that they should have such a wish. I have taken pains to get a copy of the report, and I have done that ever since there was an agricultural department. I have noticed that only one agricultural student has graduated from the opening until now. I know there have been hundreds of dollars donated to the university just for the purpose of improving the farmers here.

I challenge those that have read them to deny the charges I make. There were some experiments about raising potatoes; we got better experiments right around here. They tell us the weight of corn fodder, that we could not get.

I think there is nothing as important as feed, yet their experiments have all come from Germany, and it does not meet our wants.

We want the university to make experiments on our products, and it can be done. You have chemists enough in that university who can do it.

We have asked for bread and you have given us a stone. You know our wants. You know our ignorance. You know not only our wants, but you know that we are so ignorant that we don't know what to ask for.

Pres. Favill — You looked for your information in the wrong direction.

Prof. North — We have given thousands to the university, and should we go to a little one horse fair like this in order to get it?

Pres. Favill — You have had to come here to get it at last.

Prof. Henry — The gentleman has told some very true facts. We have had nominally an Agricultural Department at the State University. My going to the university is largely due to Regent Smith. I am a new man, so please give up criticising and turn over a new leaf. I am not responsible for what the other professors do. I would say to the gentleman that I have made as careful a study so far as a young man can. I am trying to work up the sugar cane at present, and a letter comes to me asking if I am a practical man and know how to plow. (Laughter.) For the benefit of that gentleman I would say that I can plow and have plowed day after day. As a plowman I am worth $1.25 a day. But it seems to me you want somebody to do something besides that.

Another point the gentleman has hit on that I wish you to all ponder upon. He stated that but one student ever graduated

from the agricultural department. That is true. We have sixty young men studying law, I have converted one to agriculture. We have got the department ready and I have mapped out a course. I will send a catalogue to any man here, and I don't see that I can do any more. I can't furnish the boys.

Prof. North — Ain't you married? (Laughter.)

Prof. Henry — No, sir. I wish to say to the gentleman that I was so afraid I would not be well received here in the west, that I thought best to leave the girl east for a while. Now, gentlemen, here is a question:

There are fathers and mothers before me who are bringing up children. Their bright boys are beginning to look after a clerkship or take a trade. Others think to study medicine or law. How often have you heard the mother say: "I don't want John to stay on the farm, I want to make something better out of John than a farmer." So these boys are encouraged to leave the farm. Bright boys won't stay on the farm, but the dull ones will.

If we could only infuse science into the farm work, I am not afraid but that the boys would stay. Now, what I want you fathers and mothers to do, is to take your children who are just beginning to talk — your children who are five years old, and ten — and say to them, "when you are big enough I am going to take you down to Madison. There is an agricultural school there. There are forty professors, and we are going to give you the best education we can. Instead of giving you forty acres of land, we are going to give you $200 and a college education."

Now, if you would talk to your children in that way, there would be more intelligent farmers. Don't say to them, if you are going to be *anything* you have got to go off the farm. That is what has filled our law department. I think half of those studying law at the university are off the farm. The country gives the city bread, butter and brains.

Can't we get some of our bright boys to stay on the farm?

After I had gone to Madison, an agricultural college in Kentucky wanted a man who had studied the subject of agriculture, and one who had graduated. They asked me if I knew of one: "We will give $1,500 a year." I thought a moment and said "No, sir." Why, gentlemen, if they had wanted a lawyer, I could have sent them a car load at $500 a year. (Laughter.)

Now, gentlemen, if you will come up and show us that you are interested in agriculture, and if you will write to the president that you need help, I guarantee that you won't wait long.

And be sure to talk to your children, and tell them you are going to give them a better education. You came out here pioneers. This has made smart men of you. You have gained sharpness through adversity. But your boys are coming up in ease. Your bright boys are going to wreck and your dull ones are standing back. The farming class in fifty years will not be as intelligent as they are to-day, unless they take some other way of drilling. There are only two other ways possible. Either send your boys out west or put them in school where they will become intelligent, and you will then have your recompense. Adversity has made most of our Wisconsin farmers. Let us make them in the future by education.

W. D. Hoard—I have been very much interested in the remarks of Prof. Henry, and I want just here to give you a fact or two. He says the city receives its recruits from the country. I stood last winter in the Produce Exchange in New York city. Alongside was a schoolmate of mine, Mr. Armour, of the firm of Armour & Bro., pork packers. We were brought up boys together, and were farmers' boys. I said to him, "these are pretty bright looking men." He turned to me and said, "there is one fact I want to tell you. These men you see before you have a very large controlling influence on the commerce of the United States, and how large a proportion do you think of these New York city men were farmers' boys?" I confessed I could not say. "Eighty out of every one hundred are raised on the farm," he said.

Well, now, that is a very important fact. It must be so. It has got to be so. I was raised on a farm and I know what it means to be a farmer in Wisconsin to-day. I sympathize very deeply with the progressive spirit that would try to ennoble agriculture. We should strive to make it one of the leading avenues of thought of the day and age. But what can you do? It lies with the farmer himself, who is content to be a clod rather than a lord in his own business. Now the farmer spends from morning to night cursing his hard lot; dishonoring his business, and the boys most emphatically agree with him, and just as soon as there is a chance between the "*nip*" and "*tuck*" to get a living outside of agriculture, those

boys will rush into it. What is the result? We have many boys in our own town striving to be lawyers. They were fourth rate farmers but they will make tenth rate lawyers.

I have taken a great interest in agriculture in this state. I have found my work to be in the newspaper and in private talks with farmers and farmer boys. I don't own a farm. Though bred a dairyman, I have found my life work somewhere else. I have three boys and I find those boys to-day are bothering me tremendously. Two of them, at least, want to get out of the newspaper business and go west and farm.

Voice — Sensible boys. But I want them to first learn a trade; first take the discipline right here and then they can go west and farm. The great lack everywhere among the farmers is commercial intelligence, and the consequence is, they ask just such foolish questions as one man did of Prof. Henry. "Can you plow?"

They demand that the farmer shall gain his intelligence by the hand, not by the head. The hand is servant of the brain, not its master, and God pity that man who has a strong hand but a weak head.

Now I say to my boys, wait a little while; I am going back to where I came from and am going on to a farm, but I can't go just yet; I want you first to get an education. I want you to graduate; I want you to get discipline. The only thing that taught me discipline was going into the army, where I learned there was power in system. So I tell my boys that the printer's trade will help them to learn the value of system, and then we will all go to the farm together.

Farmers' boys always want to leave the farm. One boy said to me, "Mr. Hoard, can't you give me an opportunity to learn the printer's trade." I fear not I said. "I wish you would." Well, I said, why? "I want to leave the farm." Why do you want to leave the farm? "I should hardly think you would ask such a question as that." Well, tell me why?

"Look over this country, and where is the chance for a man to be a man if he is a farmer?"

Well, I said, my boy, you are mistaken. There is a grand chance to-day for an intelligent man on the farm to become a power as a farmer, as a politician or as a reformer. He can plow himself most grandly into the convictions of men everywhere. Don't you be

beguiled into leaving the farm. More leisure is on the farm than in any business I know. I never worked on the farm nineteen hours out of twenty-four, yet I have done that the past month. I never kept myself going 365 days and not know what Sunday was on the farm; I never did that, but I have been obliged to do it in my business for the past few years.

Farmers, you do not look at your business with any sort of an idea of its grandeur, and by not doing so, you do an irreparable injury to your boys, and I say it is a great mistake.

Prof. Henry — If there is any person here who thinks that he can use a catalogue of the University at Madison to any advantage, even ten years from now, if he will give me his name, I will see that he gets one.

Prof. North — Can a boy with a good common school education go to the University and get an agricultural education without Greek and Latin?

Prof. Henry — There is no Greek or Latin in that course.

Prof. North — Can you tell us what subjects are necessary for a boy to study?

Prof. Henry — We admit farmers lower than any class in college. They are required to pass a thorough examination in the common school branches. (That does not include algebra.) I would advise every boy to teach school a little before coming. For the regular college course he should have in addition to that, some algebra and a year's German, if possible.

Every farmer's son should study enough, in fact, so that he could be an intelligent farmer or enter the political arena and become a member of the United States senate. He should know far more than the man you are going to send there next week.

BUTTER MAKING.

BY MISS FANNIE MORLEY, BARABOO.

Fashion and style of dress change, and with them our ideas of what is beautiful and becoming change also, insomuch that we naturally conform in dress, to some extent at least, with the prevailing fashion. If this, though of no pecuniary benefit, rather the opposite, adds to our pleasure and gratification, how much more should

it add to our satisfaction to be up with the times with our various vocations, which is, as many can testify, of great moment from a pecuniary standpoint.

A great change in the process of butter making is rapidly taking place; new ideas and theories are wiping out old-time notions, the aged little milk-pan and clumsy dash churn are going to wreck, and the milk itself is being submerged. Now, although the Cooley gives us good satisfaction, I am not here for the sole purpose of advocating that; no, indeed, but I do advocate a more thorough investigation of improved apparatus for butter making, and a more enlightened knowledge of different methods, than many seem to think necessary. We have toiled on in the old ruts long enough. It is fully time we were alive to the issues of to-day if we would not be left in the background. Our pride and ambition to be first as a dairy state have not deserted us yet, and we do not contemplate standing aside and allowing them the foremost place. Facts show that no other branch of farming is really so profitable as intelligent, systematic dairying. Consider the adaptation of our locality to this business, the present high reputation of western butter, and we may safely conclude to engage in this work extensively, confident of profit to ourselves and credit to our state. May the present outlook charm us to action.

If your neighbor is making more and better butter with less labor and expense than you are, you ought to know it and the *why*. Having obtained the desired information, put it to the most practical use your judgment suggests. I well know that with my imperfect knowledge and experience in butter making, I cannot hope to say anything really new and interesting on this subject. I think, however, a brief sketch of what *we* are now doing in this line will prove acceptable. Instead of these large pans, holding some 700 pounds of milk, we are using Cooley cans for raising the cream. We strain the warm new milk immediately into them and submerge in cold water about forty-three degrees Fahrenheit, letting them remain eleven hours, at which time the cream is all separated from the milk.

The philosophical explanation of the scientific principles involved in this submerging process for raising cream is very simple. *Water* being a better conductor of heat than *air*, the warm milk submerged in very cold water cools more rapidly than if placed in air equally

cold. Rapid cooling makes the milk heavier, and in descending it forces up the lighter cream, and I suppose that by the time the milk is thoroughly cooled the cream is all at the top. The weather can exert no influence upon milk set in this way. The result is always uniform, if the same conditions be observed, and all practical butter makers appreciate the value of a uniform quality of cream and butter.

We follow as closely as practicable the rules laid down for using the Cooley, and the result is we make fully three-fourths of a pound of butter more than obtained from the pans to each one hundred pounds of milk. It was quite startling to realize the fact that we were feeding out in sour milk between thirty and forty pounds of gilt-edge butter per week, yet that is virtually what we were doing.

Cooley cream is thin, sweet and very cold when taken from the milk, and we found some difficulty in bringing and maintaining it at such a temperature as to sour it in the desired time (forty-eight to sixty hours), new cream being added each milking time till within eight or ten hours of churning. I quote a few words relating to this subject of curing cream from Prof. X. A. Willard.

Speaking of the fine aroma in butter so much sought after and admired by lovers of butter, he says: "If the temperature of the milk when set for cream be about 60 Fahr. it decomposes, forming lactic acid and several other new principles, among them aromatic principles, and it needs but to churn the cream to obtain aromatic butter. If, on the other hand, the temperature of cream at such time be near the freezing point, the decomposition necessary for production of aromatic principles is held in check, and consequently the aroma of butter obtained from fresh cream is so feeble that it is not perceptible to persons accustomed to butter prepared as above indicated, in the same way as French butters are now made. But if it be desired to obtain a more aromatic butter, all that is required is to place the cream in circumstances favorable to lactic fermentation and a few hours will produce the desired effect. It is obvious that incipient decomposition, which is but another term for ripening, develops the flavors we so much admire; and it is equally obvious that these pleasant flavors become unpleasant after a time, as decomposition proceeds. Thus it follows that a given degree of acidity is useful in both cheese and butter making, developing as it does the flavor and aroma."

For curing cream we are now using a heater, which proves to be the right thing in the right place. It consists of a galvanized iron tank, large enough to contain two thirty-gallon cream cans, supported by a wooden frame work above and connected with a small boiler, constructed on the same principle and very similar to that commonly used under a cheese vat. That is, the fireplace in the boiler, surrounded, except at the ends, by a water chamber, which is connected by means of two pipes with the tank above. Of course, you see that when the water around the fire begins to heat it will ascend in the higher pipe as the cold water descends in the other pipe to fill its place, so that the water in the tank can be warmed sufficiently in a short time, and with the use of but little fuel. The tank also has an aperture near the top, so that if desirable, we could have cold water running through it. Hence, the cream can be kept at the desired temperature both summer and winter by the aid of this arrangement. It is important that the cream should be stirred frequently and allowed to stand eight or ten hours before being churned; as if new cream be added during that time, it will not have become properly cured, and hence may be lost in the buttermilk.

Sixty-two degrees Fahrenheit seems to be the right temperature for churning Cooley cream in winter, since if colder, I find it requires a longer time in churning, and if at a higher temperature a less amount of butter is obtained.

We are using a square box churn, manufactured by Cornish & Curtis, of Ft. Atkinson, Wisconsin, which we like very much, as it does its work in the best possible manner, is well made and easily managed. It has a capacity of 125 pounds of butter, is run by horse power, and usually requires about forty minutes to bring the butter. As soon as the butter will permit and while it is yet in fine grains, the buttermilk is drawn from the churn and cold brine poured over the butter to wash it. There seems to be great difference of opinion entertained by butter makers concerning this washing operation, many claiming that it should be washed, and *vice versa*. Prof. Arnold explains the reason of this in the following words: "The *flavor* of the butter which has been washed is different from that which has not been washed. The difference between washed and unwashed butter is analogous to the difference between clarified and unclarified sugar. The former consists of pure saccharine mat-

ter, the latter of sugar and some albuminoids and flavoring matters which were contained in the juice of the cane mingled with it, which gives a flavor in addition to that of the sugar. Brown sugar, though less sweet, has more flavor than clarified sugar. When unwashed there is always a little buttermilk and sugar adhering to the butter that gives it a peculiar flavor in addition to that of pure butter which many people like when it is new. Washing removes all this foreign matter and leaves only the taste of the butter pure and simple. Those who prefer the taste of the butter to that of the foreign ingredients mixed with it, like the washed butter best. The flavor of butter consists of fatty matters, which do not combine with water at all, and therefore cannot be washed away by it. The effect of washing upon the keeping qualities of butter depends upon the purity of the water used. If the water contains no foreign matter that will effect the butter, it keeps the better for having the buttermilk washed out instead of worked out. Evidently the grain of the butter will be more perfectly preserved if the buttermilk be removed by careful washing. The grain is such an important factor in the make-up of fine butter that it is necessary we should be very particular not to injure it in any way if we would excel in the art of buttermaking. But to return to *our* butter. After being washed it is salted at the rate of one ounce of salt to one pound of butter, while yet in the churn, and the salt evenly distributed throughout the butter by revolving the churn forty-eight times around. It is then taken out of the churn, allowed to stand a few hours, carefully worked over and packed.

During the past five years we have made a practice of shipping our butter regularly to J. H. Phillips, Chicago. Nearly all of our butter made during this time has passed through his hands, selling for a price sufficiently remunerative to justify our continuing in the butter business.

In closing, I wish to refer briefly to the erroneous idea, so prevalent among people generally, that only those of long experience and mature age can excel in butter making. Just abandon this fancy and give us younger people a chance, and we will show you we are willing to learn, and having learned, are competent to manufacture the real gilt edge. Hon. Hiram Smith, a few weeks ago, expressed as his opinion, that for any intelligent person to learn all he *needs* to know of butter making, requires from ten to twelve

days' experience. The length of time, however, depended somewhat on how many erroneous lessons he has to unlearn. Though my own experience does not fully coincide with Mr. Smith's ideas, still I think if this work of butter making be transferred from the patient, tired hands of *mother* to our own, we shall soon be in possession of an attainment, an *accomplishment* in the highest sense of the word.

"Beautiful hands are they that do
Work that is earnest and brave and true
Moment by moment the long day through.
Beautiful feet are those that go
On kindly missions, to and fro,
Down loveliest ways, if God wills it so."

President Favill — The ladies of the Congregational church have prepared a banquet for the association, to be given at the Mansion House at six o'clock, where we are to have toasts, speeches and a poem by Prof. Rockwood.

We will now adjourn to the banquet.

EVENING SESSION.

BANQUET — TOASTS.

Quartette — Hughes, Doane, Evans and Olin.

Poem — Prof. Rockwood, Whitewater.

The American Milky Way — "Studded with Stars of the Brightest Lustre." Response by Hon. X. A. Willard, Little Falls, N. Y.

The Statute of Frauds — "It may be useful for some purposes, but it does not take in Oleomargarine." — Response by D. H. Sumner, Waukesha.

Solo — Prof. Fish, Milwaukee.

The Alderney Cow — "Little, but O ——— !!!" — Response by Prof. North, Pewaukee.

The Farmer's Wife — "Mother of Statesmen." — Response by Prof. W. A. Henry, Madison.

The Rising Generation — "May it prove the real cream of the World's Dairy." Response by Ed. F. Gleason, Waukesha.

The Dairy Pursuit — "The Cream of Agriculture." — Response by Hon. H. D. Sherman, Monticello, Iowa.

Duet — Hughes and Olin.

Our Worthy Hosts — "The People of Waukesha." — Response by Hon. Hiram Smith, Sheboygan Falls.

The Legal Profession — "It takes the Cake, if not the Cheese." —Response by M. S. Griswold, Waukesha.

Our Distinguished Guests — The "Dairymen of Wisconsin." — Response by Rev. C. W. Camp, Waukesha.

The Dairy Maid — "Down with the Man who respects not her call 'To Arms.'" — Response by W. D. Hoard, Fort Atkinson.

Solo — Prof. Fish, Milwaukee.

Water — "It has its Relation to Dairying, but it is the *sine qua non* of Waukesha." — Response by T. W. Haight, Waukesha.

The Old Fashioned Cow — "May she never want a Champion to sound her praises." — Response by C. R. Beach, Whitewater.

The Statutes of Limitation — "Though no bar to the Dairyman's Bull, it shuts off long speeches from outsiders." — Response by E. W. Chafin, Waukesha.

Quartette — Hughes, Doane, Evans and Olin.

THE PIONEER COW-BOY.

BY PROF. S. S. ROCKWOOD, WHITEWATER.

[Read at the banquet of the Dairymen's Association, at Waukesha, January 13, 1881.]

A summer sun in the blazing west,
A sense of the coming of silence and rest;
A wild dove perched on a dead limb alone
Softly repeating her sad sweet tone;
Advancing shadows of the near oak wood
Across the demense where the forest stood
Ere the pioneer's ax with its eager edge,
Chose the fairest out for the rail-splitter's wedge;
Gathering gloom on the eastern slopes,
Deepening dusk where the hoot-owl mopes
Grouped at the end of their toilsome bout,
Chaffing the last of the binders out,
Cradlers whetting in each other's face
Their half-meant challenge to a final race;
Stretched in the stubble the bundles lie
Waiting the hand that shall test the tie —
The hand of the boy who with multiple knocks
Shall gather them in for the ultimate shocks.
Suddenly over the din is heard
A voice of command with a kindly word,
And away in the eye of the setting sun
The cow-bow starts in the midst of the fun.

A wonderful journey's before the lad,
A finer no traveler has ever had;
It stretches away to the realm of dreams

Where joy is real and sorrow but seems.
Like the messenger god his feet have wings
And are light and airy as the song he sings;
A breath of the summer is on his face—
His flowing locks are banners of grace;
His bare head feels as a natural good
The grateful shade of the darkening wood.

A subtle science and a cunning art
Are more than a match in every part
For the heedless ways of the wandering herd,
Whose haunts are known, or quickly inferred.
The tell-tale bell may ring or not,
His certain skill will find the spot,
And through the crowding shadows tell
Each face and form he knows so well.
He starts the drove with a sudden swoop
And a pulsating shout like an Indian's whoop,
Then follows as best through the thickets he may
To the end of the journey and end of the day.

In the road's dusty way stand the sleepy-eyed kine,
Or, with ruminant breath blown afar, they recline;
While, perched on his tripod, this son of the soil
Forgets there are thorns in the pathway of toil;
And the flashing white streams, as the cradlers come home,
Drum a muffled, soft tune in the odorous foam.

Ah! what do we know, with our pastures set
In squares and rectangles, duly met,
Of the winding paths and pathless ways
Of Uncle Sam's commons in pioneer days?
Or what do we know of that wild, free life,
With its yell of the savage, and flash of his knife;
With its howl of the wolf on the distant hills,
And its crack of the rifle whose sure aim kills;
With its boundless regions, where nature alone
Works out her wonders in wood and stone,
And the birds and beasts with their curious eyes
Took the stranger in, with a sharp surprise?

Little of all that we feel or know,
In the midst of our modern glitter and show,
Is akin to that elder world we knew
When the wind, from the gates of the morning, blew
Across the rounded horizon's bounds,

Unfreighted by burden of human sounds.
Little of all that we have and hold —
Little, indeed, when the all is told —
Keeps alive in our hearts and homes to-day
The spirit of a life that has passed away —
The flavor of youth, as our heads grow gray.

The annual banquet of the association is now looked upon as part of the convention, and certainly no part of it is enjoyed more.

The ladies of the Congregational church prepared an elegant supper for their 300 guests, which was enjoyed by all. With splendid singing and eloquent speeches, the evening was passed in a most enjoyable manner.

The association will be glad to hold another convention at some future day at the "Saratoga of the West."

MORNING SESSION.

FRIDAY, January 14, 1881.

President Favill called the convention to order, and said the first order of business was the paper by Mr. Hazen.

THE CO-OPERATION OF MILK PRODUCERS AND MANUFACTURERS OF BUTTER AND CHEESE, AS PRACTICED IN WISCONSIN.

BY CHESTER HAZEN, LADOGA.

It is announced that co-operation of milk producers and manufacturers of butter and cheese, as practiced in Wisconsin, is to be my subject. It will hardly be expected that I should attempt to give a history of the factory system from its commencement, but take it as it now exists. The advantages of manufacturing butter and cheese (cheese more particularly) by the factory system are too well known and appreciated to need any comment by me. The relations and responsibilities of patrons of factories, and the manufacturer, is the point I wish to get at.

Nearly all factories have or ought to have some articles of association, rules and regulations by which they are to be governed. All cheese and butter factories are co-operative associations, and the duties of patrons and manufacturers should be plainly set

forth, so all can understand them. As the future success of the Wisconsin dairy interest depends very much on the strict adherence to, and fulfillment of those obligations, I wish to thoroughly impress them upon the minds of all concerned.

In order to produce a first class article, first class milk is the first thing required. It isn't enough for patrons to deliver milk at factory as many patrons do, in a careless way, much of it in bad condition, caused by not properly cooling, and caring for it as soon as drawn from the cows. It is the duty of every patron to cool and take good care of his milk until it is delivered at the factory. And the duties of patrons and manufacturers should be plainly set forth so all can understand them. As the future success of Wisconsin dairy interests depends very much on the strict adherence and fulfillment of those obligations, I wish to thoroughly impress them upon the minds of all concerned. I will try and state some of the difficulties patrons have to contend with where milk is delivered but once a day. In warm weather it should be cooled down to 60 degrees as soon as practicable; the cans left open so as to admit of free circulation of the atmosphere, and the cans should be kept where nothing but a pure atmosphere can reach them. It is too often the case that milk cans are left over night near the yards, and sometimes hog-pens, surrounded by a bad atmosphere, which will invariably affect the milk in proportion as it is exposed to such influences.

Another difficulty often arises from cows running in pastures where there are pools of stagnant water which they are sure to drink, which will invariably affect the milk. Cows in a pasture where bad odors come from various causes, such as carrion, hog-sties, etc., are sure to produce a bad flavored milk.

These are lessons that too many patrons have yet to learn, or if they have already learned them, they too often fail to heed them.

Good water and pure and clean flavored milk are indispensable in producing a first class article of butter or cheese.

Nothing short of this will enable the manufacturer to produce an article of butter or cheese that will give satisfaction to his patrons.

Patrons, what is for the interest of the association is for your interest. Don't cheat yourselves by trying to deceive your cheese maker. Don't be selfish enough to think your milk is a little better than your neighbor's, and you can put in a little water, rinse

out the pail and strainer and add it to the milk, or take off a part of the cream from the night's milk, and then it will be as good as your neighbor's. Don't go to the cheese maker and say to him, after the season for delivering milk is past, that Mr. A. or Mr. B. was seen, or some one of his family, with a pan and skimmer over the milk can, and intimate that there was cream taken from the milk. But if you suspect anything wrong, go to the manufacturer as soon as you discover anything out of place and inform him of it.

I have had it occur several times in my own experience that a patron would say to me that there were patrons that had skimmed their milk, but would not say who they were. This was the best kind of evidence to me that such patron was doing the same thing himself.

The natural tendency is that milk will deteriorate in quality where factories have been in operation for a number of years from this cause. Dairymen that furnish milk to factories will select cows that give a large quantity of milk, regardless of quality. I have run a factory for seventeen seasons, and I do believe that the quality of the milk as delivered at my oldest factory has in that time depreciated from five to eight per cent. in quality from this cause alone. What can be done to remedy this difficulty I am unable to say, unless it is to fix some standard by which milk can be graded similar to the grading of grain in our principal markets. This would be a very difficult task to perform.

I can see no other practical way to dispose of this milk question than to deliver the milk at the factories pure, just as it comes from the cows (only have it properly cooled, etc.),— no cream taken off to put in the coffee or cook codfish with.

If cows are well fed and cared for, there won't be a very great difference in the quality of the milk from the different dairies that deliver milk at any factory. Still, the pastures have something to do with the quality of the milk.

My experience and observation have convinced me that dry, rolling lands, such as are well adapted to raising grain, will produce a quality of grasses that will produce a better quality of milk than low, wet or marsh lands will, even with the same variety of grasses. I think most of our dairymen have had sufficient experience in this direction to satisfy themselves of this fact.

When butter or cheese factory associations agree to accept the

milk as it comes from the cows, they are morally bound to deliver it so. If patrons should succeed in deceiving their cheese maker or brother patrons, it does not follow that that is the end of it. There is one you cannot cheat or deceive; that is yourself. There is no such thing as throwing such responsibility on any other party.

Our legislature has passed what is called a law to prevent fraud in the manufacture of butter and cheese. It seems to be a rather severe one, but in this case, parties offending against the law have to be convicted of the crime before the penalty can be enforced. But to the party offending against the moral law there is no escape; they are already convicted of a crime, of a guilty conscience. That is out of the power of anyone to escape the penalty. I will read the law of Wisconsin in regard to the delivery of milk to cheese factories.

AN ACT to prevent fraud in the manufacture of cheese.

The people of the State of Wisconsin, represented in Senate and Assembly, do enact as follows:

SEC. 1. Whosoever shall knowingly sell, supply, or bring to be manufactured to any cheese manufactory in this state, any milk diluted with water, or in any way adulterated, or milk from which any cream has been taken, or milk commonly known as skimmed milk, or whoever shall keep any part of the milk known as strippings, or whoever shall knowingly bring or supply milk to any cheese manufactory that is tainted, or partly sour, from want of proper care in keeping pails, strainers or any vessel in which said milk is kept, clean and sweet, after being notified of such taint or carelessness, or any cheese manufacturer who shall knowingly use or direct any of his employes to use for his or their individual benefit, any cream from the milk brought to said manufacturer without the consent of all the owners thereof, shall for each and every offense forfeit and pay a sum not less than twenty-five dollars nor more than one hundred dollars, with costs of suit, to be sued for in any court of competent jurisdiction, for the benefit of the person or persons, firm or association or corporations, or their assigns, upon whom such fraud shall be committed.

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

Approved February 28, 1866.

I have dwelt some time on the duties of patrons, and will now try and state the duties of the manufacturer.

When patrons do their duty as above stated, they have a right to expect a fine article of butter or cheese, as the case may be, and should demand it. If the manufacturer cannot produce a fine article from such milk as I have stated should be delivered at the fac-

tory, he should be required to make up the deficiency in price to his patrons.

The success of any factory depends very much on the cheese maker's ability to perform his or their part of the work intelligently.

And the copartnership does not end here. The goods are to be marketed, and I believe as a general rule that dairy products should be sold as soon after they are ready to ship as the conditions of the markets will permit. Here is a duty that rests on the manufacturer: That the cheeses are carefully weighed and boxed in good condition, and see that no poor cheeses are put in to work them off on to the purchaser for good cheese. This has been practiced to some extent, but has, I think, caused much trouble with the dealers.

On the whole, I think as long as Wisconsin dairymen are making full stock cheese, and expect to sell it on its merits, they cannot afford to take any chances by trying to deceive their customers or themselves. We have many difficulties to contend with, and new ones are making their appearance every season. The manufacture of butter and skim milk cheese is a serious obstacle to overcome.

Oleomargarine butter next put in its appearance.

The last but not least, is the introduction of butterine in many of our large markets.

This butterine is a mixture of butter and lard, being mixed by some process best known to the makers, so it is a very good imitation of butter.

All of those obstacles we have to contend with, and the only way that we can compete with them successfully is by acquiring a more thorough knowledge of our business and giving it close attention, so as to produce a quality of goods that cannot be mistaken for skim milk cheese, oleomargarine, or butterine or lard butter.

Q. Is the manufacturer responsible before the law if he gets good milk from his patrons and fails to give a good article of cheese? Have they any grounds for action?

C. Hazen — I think if the patrons lose by it he is amenable for it. I would like to say a few words about the organization of this association. The association was organized at Watertown, February 15, 1872, officers elected and articles of association adopted. The officers were, Chester Hazen, president, Brandon; vice presidents,

Hiram Smith, Sheboygan Falls, H. F. Dousman, Waukesha; secretary, W. D. Hoard, Lake Mills; treasurer, Walter S. Greene, Milford. There were present besides, H. C. Drake, of Lake Mills, Stephen Favill, our president, and one or two others whose names I cannot call to mind. With this small number we commenced our work, but no work of any account was done at this meeting more than to perfect the organization and set the time for the next meeting, which was to be held at Watertown, February 11, 1873.

At this meeting there was an address by the president, and essays by M. S. Morrill, E. H. Jones, Geo. D. Curtis, Hiram Smith and others.

This meeting was well attended, and among those taking part in the discussions were Jenkins, of Rosendale; Favill, of Lake Mills; Barrett, of Burnett; Ingalls, of Milford; Hull, of Farmington; Coburn, of Whitewater; Curtis, of Rosendale; Geo. E. Morrow, of Madison; Chapman, of Columbus; Dousman, of Waukesha; Hiram Smith, of Sheboygan Falls, and many others.

At this meeting the same officers were re-elected, and the next meeting appointed, February 17, 1874, and to meet at Fond du Lac.

Our goods were not known in the markets of the world. We had great odds to contend with. Wisconsin dairy products in our general market were at a discount. One of the objects of the organization, and the principal object at that time, was to overcome that difficulty. By our efforts in that direction, we improved the quality of our goods. We had our annual meeting, and exchanged ideas, and concluded we had got to make a better article of butter and cheese than we had before. We soon commenced to ship cheese to New York city. I had been recommended to a business firm there, and had corresponded with them in regard to shipping cheese. They wrote me to send them a car load of cheese, but particularly requested me not to put any mark on the cheese boxes — either Wis. or Western — but send them without any marks, so that the dealers could not get a clue of where they came from.

I shipped the cheese that way, and got good results. From that time most of my cheese has been sent there or to Europe.

I believe it was in 1876 that our State Agricultural Society (that had charge of the funds appropriated by this state to make a cen-

tennial exhibition) gave us $500 to make an exhibit at the centennial. We made our exhibit, and the result was more than we anticipated. We got our full share of premiums, and it brought our products before the general markets of the world, and from that time we have had no trouble in having cheese buyers purchase our cheese at home.

At this time we had overcome the difficulty for which we had organized the association, namely, the prejudice against Wisconsin products.

The next difficulty that came was skim-milk cheese. I want to talk a little on this point, as I am interested in that particular business. It is my opinion that the most money is made in making butter and skim-milk cheese. Our association has made a desperate effort to raise the standard of our cheese. We are all aware of the difference in consumption of poor and good cheese. If consumers like it, they buy it. Now take that right home; you know, if your grocer gives you a poor article of cheese, you don't go very soon to get any more. This tends to ruin the cheese trade at home. If we put cheese on the home market we should put our best. Encourage home consumption. Cheese is an article we can't hold over as we can wheat. It has all got to be dispensed in a season. When cheese gets up to 12 cents a pound it is beyond the reach of most consumers. Cheese will accumulate in the market and then there will be an overstock. This causes a reaction such as we experienced two years ago, and it may be brought back this year. I think there is more cheese in the market at present than most dairymen are aware of. If that cheese had only been sold at a fairly remunerative price, much more would have been used up, and the prospects of the future market improved. All these things are worthy of our consideration as an association.

The next difficulty that arose was oleomargarine, which has taken the place of ordinary dairy butter, and is used in preference to ordinary butter. It retains what good qualities it has longer than dairy butter. Its object is to take the place of dairy butter more or less, as long as we continue to put such butter upon the market.

The next difficulty was the lard butter, which we are not so well acquainted with as oleomargarine, yet I think this a worse enemy than the first.

The butter market at the present time is in a very bad condition,

and I think it is on account of this that poor butter is being manufactured right here at home. The only way we can overcome these difficulties is to *produce the best article at home.*

Hiram Smith — I am fearful that a wrong impression will go out from the remarks the last gentleman made concerning skim milk cheese. He said there was more money made in making butter and skim milk cheese. That is a question that has often been disputed. It depends not so much upon the quotations as on the actual facts.

Now, in Elgin, the custom is entirely different from Wisconsin, but I think our system is preferable to any other. The system in Elgin is to sell upon the dairy board, and it all goes into Chicago and is reweighed, assorted, rejected, etc. The same is the case in New York.

There are serious complaints against this system. It is a very common thing, under such a system, that their rejections and short weights greatly affect the price quoted. Now, if we take the price quoted as 9 cents for skim milk cheese at Elgin, and it goes into Chicago, and the net receipts are 8½ cents. We are deceived now in Wisconsin. The cheeses are all inspected by the buyer or his agent at the factory, and the rejections all made there. The money is paid as soon as they are unloaded.

This system has been nowhere else adopted. Nothing but the excellence of our cheese would have enabled us to accomplish it; but, it being established now, all dealers in Chicago or New York conform to that rule.

"FAMILIAR TALK ON DAIRY TOPICS."

By W. D. HOARD, President Northwestern Dairymen's Association, Fort Atkinson.

Mr. President, Ladies and Gentlemen — It does not very much matter whether I talk or not. I am a good deal like the whisky the old fellow drank, who said it was mainly for "*chinking.*" Now I am put down for familiar talk on dairy topics — it will be very familiar.

I have a few heads sketched here, which have been the result of a general thinking upon several topics. I might say that the central thought will be some mistakes that I conceive are made by

our farmers. I don't think there is any particular necessity of attempting to instruct manufacturers. The great class to whom we look for help in dairy matters are the farmers, the milk producers. Just in proportion as they rise the manufacturer will rise. He is but the answer to their progress.

Cheese making has ceased to be a farm product. It is to be classed among the manufactures of this country. It requires commercial judgment, skill and intelligence, and that cheese manufacturer that is not successful, is so, as a rule, because he lacks commercial judgment. Therefore, I say, it has ceased to be a farm production. To be sure it is made from a farm product, the same as our clothes are made from the wool that the farm produces; but the cheese, as well as the cloth, is manufactured in a factory.

I want to get at the man that produces the milk. I want to see that man's profits enlarged. I want to see his labors lightened. I want to see his intelligence increased. I want to see his family happier and his home more cheerful, and the man, and all that belongs to him, a better product of this day and civilization. That is what I want to see. I have sketched in my mind a few things wherein I think he might make some improvement.

First — I conceive that the dairy farmer makes a great mistake in his estimate of the cow. I find scattered, almost universally, over Wisconsin this conception of a dairy cow: "I want a cow that, when I have got through milking her, will make good beef." Now, suppose we take the reverse, and say "I want a cow that when I can't make beef of her I can milk her." These two distinct qualities are not found in the same animal with equal power of development, and I can see that the farmer who forms his opinion of a cow on that basis has made a very serious mistake. It is not good, sound business judgment for a man to throw away ten years of butter production in order to sell thirty dollars worth of beef. Suppose a cow gives 700 pounds of butter and lasts five years, $5 \times 700 = 3500$ pounds, at thirty cents per pound, will amount to one thousand and fifty dollars. Now, do you think the farmer that will reject that cow, because, when he has got through with the little creature, she won't turn off thirty dollars worth of beef, is a wise man? He would be like a man who took an old fashioned cent and held it to his eye so closely as to swear there was no moon. It is done every day. When the farmer has got through milking a

good cow he should say, "Good bye, old bossie, you have been a faithful servant and you shall now be placed in the earth. All I can expect to save is your hide." And that is all he has any right to expect.

I believe the farmer makes another great mistake, that is of importance, and one that has a wide bearing upon his welfare. I refer to the preparation and management of food. And let me say to you that while we have arrived at considerable excellence in making butter and cheese — while our reputation is good, yet the judgment and economy of our farm management is very much behind that of the eastern states. Our farmers have not learned to be economical feeders. They have not learned to house their stock well. They have not yet learned the best elements in the management and breeding of their cattle. Winter food enters very largely into the economy of dairying in Wisconsin, and whether your cows are profitable or unprofitable will depend very largely upon how well you figure the question of winter food.

This little bundle of ensilage which I hold in my hand, is a result of the efforts which are being made in the eastern states to solve the question of cheap yet nutritious winter food. I scarcely find a dairy farmer in Wisconsin who has cut his hay for his cows with any reference to the profit of its feeding. I have not been able to buy for my two cows this year a single pound of what I call good hay. If they have got any they won't sell it. I don't believe, gentlemen, that you can go into Jefferson county and find ten farmers to-day who cut their timothy before it blossoms.

Voice — They have been taught that is not the best way to do.

Hardly, my friend. I think you will find that the best dairy intelligence has been teaching you to cut your hay greener and oftener. What is the most profitable food for a cow? Grass. How should hay be to make it the most profitable? As near as possible like grass. Farmers often say, in excuse for cutting hay too late, "It goes farther." I say, God bless your innocent hearts; browse will go further still; that is a fact. Cut down bass wood trees, and let the cows browse on the tops, and it will go further than even your poor hay; but how far will your cows go? You can't cheat the cow and escape cheating yourself. The object of plant life, the whole end and aim of its being, is to produce seed. Until that plant has fulfilled its mission, it struggles with that strange per-

sistency that looks to nature for its accomplishment. Now when the seed is formed, the growth of the stalk is arrested, and the whole energy and succulent juices of that plant have been drained out to develop the seed. The result is, that as soon as the seed is formed, the plant has lost its value as hay, or in other words, it ceases to be like grass. You should cut your hay for your cows while it is the nearest like grass.

The next thought I come to is another mistake my farmer friends make. It seems to be hard to convince my farmer neighbor that his business is just exactly like my business, and like my brother Curtis' business. He thinks that farming is not a commercial business. They often tell me they can't afford to keep help, and the refrain ascends continually: "I can't afford to hire." What can you afford to do? Can you afford to do the whole of this vast amount of labor yourself?

Some farmers are very much like some carpenters. You can think of certain carpenters that you would not trust with the fine finishing of a house. They are just the kind of carpenters that never make joints. Between one piece and another there will be a gap wide enough for a whole house to slip through. The lack of making joints stamps him as an unsuccessful business man. Not fitting the joints in their business properly, stamps so many men as unsuccessful, and often between the gaps will slip out a whole year's profit.

Now do the milk producers make well-fitting joints always? I am afraid not.

What is the representative unit of your business and mine? It is the dollar. It is the hundred cents that make the dollar. You and I should fertilize our intelligence with a thorough comprehension of the office of that dollar and of the necessary labor to make that dollar land in our pockets. I have discovered that to keep two horses to do the work of one is not the right way. To keep two men in my printing office to do the work of one is not the right way. To keep one hundred acres and pay taxes on them and fence them to do the work of fifty is not the right way.

So you see we should measure our business by that representative unit, the dollar. There are plenty of men here cursed with too much land, and if they would only be obedient to the reason of things, there would be a sale of a great many of their broad acres

before next spring. There is one cow to every twenty-eight acres of land in Jefferson county. I tell you that poor cow has to exert herself tremendously to pay a profit on that land. When you have loaded that poor cow with the interest, cost of fencing and the general cost attending agriculture on that much land, you have asked more of her than God has given you any right to ask.

Farmers are also cursed with the foolish idea that they can't afford to hire help. Nothing is so cheap as rude muscular labor; nothing so scarce in farming as management, brains and the final persistent judgment that makes the business a success. I can find plenty of printers to work in my office, but few who can take my place as manager. Therefore, muscular labor is the cheapest, and farmers make a great mistake when they decide they cannot afford to hire.

I will repeat a portion of what I said yesterday concerning Mr. Chas. Phillips, of Lake Mills. He said "it was worth all that I am worth to-day, to me, that I could not work. Had I been able to work hard with my hands, I would have put myself into the field along side of my hired men, and been content to measure my business from the hired man's standpoint. Farmers work too hard, and consequently exhaust themselves, so that their intelligent mental action is materially interfered with." You may say "this is all theory." "This is very nice." "This is taffy." But I tell you, gentlemen, a thing is not correct in practice that is not correct in theory. That fact I have worked out in my own business. Farming is just like any other business; it is based upon and governed by the representative unit, the dollar. The best economy, the best judgment, the sharp commercial intelligent action that makes a man successful in selling a pound of tea is exactly the same quality that makes a farmer successful in selling a pound of cheese or pork. I claim that you can make a very good merchant out of a very cheap farmer, but you can't make a very good farmer out of a cheap merchant. It requires the best quality of brain to be a successful farmer.

Let me recount one more mistake. A moment ago I spoke of this land question. I wish you would more clearly look into and practice political economy. Now I see half of you are shutting up your eyes and saying, "That is not for us; that is for scholars such as Prof. Henry or Mr. Willard or some other of these high falutin

fellows that stand on platforms and do big talking." [Laughter.] Well, now, that is not so. My little son overhearing his brother talk about political economy, the other day, asked me if political economy was cheap politics. [Laughter.] "Well," I said, "I don't know; I suppose there is economy in politics." But political economy richly applies to farming. Let me take two principles that are laid down in all sound works on political economy. Capital is divided into two classes, primary capital and working capital. What is meant by your primary capital is that capital which is locked up in your land and fences. Your working capital is the live, active, moving forces of your property, like cows, sheep, swine, horses and machinery. When you see a dairy farm of two hundred acres with good buildings, fences, all representing a primary capital of say $10,000, with a dairy of only twenty cows and a working capital of only about $1,500 all told, you need not wonder if you hear the owner say, "Farming don't pay." And you need not wonder much if you see him continue his mistaken policy by buying more land. That man has the cart before the horse. The law of relationship in capital must be obeyed in farming just as well as in making cotton goods. The way for me to make money in printing is to make a little earn much, not the reverse. Seventy-five out of every hundred of Wisconsin dairy farmers are carrying too few cows for the amount of land they possess.

I say to you, enlarge your working capital. Quit laying out your money in more land, and make the money you have more profitable. Instead of twenty cows, put on next year twenty-five cows, and every year increase by five more, until you are carrying all you possibly can. When I tell the farmers this, they are apt to say, "It can't be done."

The transition in dairy interests has been rapid, and it has not brought with it sufficient intelligence. The result is that we are a lot of wheat farmers, just commencing to keep cows. We are not yet well posted in our business, and I want to press this thought upon our factory men, that every factory is a dairy centre, and from that dairy centre should emanate an intelligent, progressive spirit of inquiry, pertaining to all questions of dairy management. Every factory man should be a teacher. It is the factory men that come here. Look at the indifference that prevails with the farmers all around here, in Waukesha county. See the empty seats in this

convention. This convention is a fertilizing piece of machinery, and it ought to have a wide effect. The farmers of Waukesha county within three to five miles of here, should hitch up their horses in the morning, and drive in here and stimulate their minds with the facts brought out in these discussions.

Now, who are the men that are always present? Those that least need it. Here are Hiram Smith, Chester Hazen, Col. Hinckley — representative men in the dairy business, who make forty dollars in this business where the average farmer makes twenty. But you will see these men always in attendance upon the conventions of this and other associations, while the men who need such influences most remain indifferently at home.

The Christian sings, "It is not all of life to live," and the farmer should sing, "It is not all of farming to dig." There is abundant room on the upper shelf for all the thought and skill our dairy farmers can invest, and our progress in dairying will always depend upon whether we measure our duty from its largest or smallest end.

CAN WISCONSIN DAIRYMEN DO BETTER THAN BY MAKING FULL CREAM CHEESE.

BY H. F. DOUSMAN, OCONOMOWOC.

Mr. President: All wealth is the result of saving, and that business is the best which, besides yielding a good income, yields it steadily one year after another, so that the disposition to save may find opportunity for its regular exercise.

Two very profitable hop crops in succession ruined hundreds of farmers in Wisconsin, both financially and morally.

They made in the two years what they naturally should have in ten. They thought, as men always do under such circumstances, that their good fortune was the result of their own wisdom, and would always continue. They consequently wasted in the third year all they had made in the first two, and have spent the last seven or eight years in bewailing their misfortunes, and looking for the chance which will never come again.

This story is old, but at the same time it is ever new, for it is founded on principles of human nature which will endure forever.

In years past the leaders of this association, in urging upon our

farmers the advisability of taking up dairying, used, as among their strongest arguments in its favor, the fact of the *certainty* of its returns, that while prices would fluctuate, so that some years it paid better than others, it *always paid something*, and was never a total failure, and the average of ten years would show handsome profits.

The results have justified all that was claimed in its favor, and to-day Wisconsin takes high rank as a dairy state, both for the quantity and quality of its productions, and many farmers have, by means of dairying, found their way from debt to independence.

And to-day, at the ninth annual meeting of this association, I am gravely asked by the executive committee to discuss this question, "Can Wisconsin dairymen do better than by making full cream cheese?" Now they must do one of three things: either make full cream cheese, or creamery butter alone, or else make butter and skim cheese together. Now the dairying of Wisconsin must be done between March and December.

Our climate and the condition of our roads determine this. The cow, to endure, must have two or three months rest in the year, and nature and the inclination of the farmer agree that this rest should be had during the winter.

To make butter successfully in a factory, the milk must be delivered twice a day, and while there is occasionally a community so situated that they can do this, to the great majority it is too great a tax.

Force of circumstances will probably always compel the great majority of Wisconsin dairymen to make full cream cheese, and it is well it is so, else they might be tempted to follow the example of their brethren of some of the other states, and commit slow suicide by adulterating their products.

Full cream cheese is the only honest product of pure milk. Pure sweet milk is the only article of food which contains all the elements needed to sustain human life, and full cream cheese gathers up all these valuable qualities, and puts them in such shape that they can be transported around the world, and be kept fit for human food an indefinite length of time.

When butter alone is made the casein goes into the swill pail, and skimmed cheese whenever made; they are a fraud and a delusion from the first.

The most that can be said of the best of them is that they are "pretty good," that is, they are not as bad as the worst; and the *best* that can be said of the worst of them is that the quicker they are buried, the sooner they will quit cumbering the ground.

They deteriorate from the day they are made, and can only be handled at all by being *kept moving*. *Somebody* always *gets left* with them, and the losses are frequently serious.

They can, on a pinch, fill an empty stomach, and so can sole leather, but fit articles of human diet they *never were*, and *never will be*. I am aware that in these latter days wise men have risen up, who say that if you will skim the milk to death, and then let it sour, and then put back the buttermilk, and then put in *anti-Huff* (a preparation which will take the tin off your cheese vats), you can make a cheese which will hold its shape, and when thirty days old have all the appearance of a full cream cheese, except as a very pleasant gentleman who sells the stuff, and whom many of you know, once said to me, "When you work it down it *doesn't grease your fingers*."

Well, I shouldn't think it would, and I venture the assertion that cheese made with it will never, if they know it, grease the stomachs of the men who sell the compound, or of those who use it in their cheese.

And yet the native lair of this beast is in Herkimer county, New York, the home of full cream cheese, and it is *there* he is beginning his deadly work.

His ravages have extended into Wisconsin, and I have, within the week, sampled in the Chicago market cheese made in our state which had this stuff in it, and when you drew a plug from it, you could smell the lye, and when you put the cheese in your mouth you could taste it.

Do you believe such cheese is fit for human food?

Is there a man here present who would deliberately eat it; and yet we make cheese for human food only, and every cheese made is a weight upon the market until it is cut up and eaten.

The more palatable and attractive it is, the sooner it is used up, and the viler it is the longer it clogs the market and by its weight drags down the price of better goods.

In my deliberate judgment each off-quality cheese made is a greater weight upon the market than are three good ones, and it is

prime, full cream cheese only that I would rank in the latter category. Full cream cheese can be made of prime quality every time, and no other kind can be.

Prime, full cream cheese can be kept indefinitely, until the markets are ready to take it, and no other kind can be.

The demand for prime, full cream cheese is permanent and constantly increasing, for it is as staple an article of human food as beef or bacon, and no other kind is.

In the making of full cream cheese the dairymen of Wisconsin have in the past found both honor and profit, and in their continued manufacture they will find that steady prosperity which brings both wealth and contentment, for in these days of skim cheese and anti-Huff cheese, bull butter, boar butter and general bedevilment, a reputation for unadulterated dairy products will have a money value which we shall be exceedingly foolish not to make our own.

ENSILAGE.

W. D. Hoard — On the 10th of January Mr. L. P. Gilbert, of our town, brought me this small branch of ensilage. He has had silo for four years. He is a very enthusiastic and practical dairy farmer. Mr. Gilbert puts the fodder into the silo full length, as he has no feed cutter to cut it with. He cuts it green and puts it in the silo and then puts the planks upon it, covering the planks with a heavy weight of stone.

Q. How much did he cut last fall?

A. I do not know.

Voice — Last year he put in ten acres. I was up to see him.

Q. Is the fodder as dry as that is?

A. No, the fodder is moist when it comes out. It has all its juices in it, but this has been out of the silo some time and is dry.

Col. R. B. Hinckley, Oconomowoc — There is an old gentleman who has built a silo near me. He would have liked to have come here to-day, but his health is poor and he couldn't come. I called on him yesterday morning with the intention of bringing down a sample of ensilage from his silo. It is different from the one just described.

Q. Is his cut?

A. Yes; he cuts his with a machine. His silo is built thirty

feet long and twelve feet deep. This is the first year he has had one. He got his silo ready, but his machinery from Boston did not get there in time, so that a part of his corn fodder rotted before he could get ready to cut it. He cut seven acres, but about four acres of it was light. He has this winter twenty-five cows, one mule, three yearlings and three horses. He has forty-eight acres of land. He gets seven gallons of cream per day, and the butter that is made from the ensilage is good color without any coloring matter in it. He feeds from forty-five to fifty pounds a day at two feeds, and one feed of marsh hay. I never saw his cows looking better than they do to-day. He has been experimenting to see how much a cow could eat of this ensilage. He took a cow and put her in a stall and kept increasing her feed until he fed her ninety pounds per day, but she could not digest that and lost her appetite. He then put her on marsh hay, and in three days she began to bellow for her regular food, so he put her back on it. He then took another cow that he had bought this fall. She was uneasy and had attempted to get out of his lot and had lost in flesh, so he put her in a stall and commenced feeding her ensilage, and in less than a week she acquired her regular weight.

Dr. S. W. Weeks, who has the silo, wrote a letter to a friend in Michigan last November, which was published, and I will read it:

"To preserve fodder by means of silos is no longer an experiment; it is a certainty founded on chemical facts and principles carried out to practical results. There is no recorded instance of a failure where the work has been properly done. Good ensilage is as sure a result as the churning of good cream is to make good butter. Cattle eat the ensilage with avidity and thrive better than on dry food. It is not claimed that fodder corn is a perfect food for cattle, either green, dried or ensilaged. It takes albuminoids, in the shape of oil meal, ground grain or mill stuff or even clover — any substance rich in albuminoids — to make a perfect food. This addition should be equal to five or ten per cent., and with such food stock will fatten or produce milk.

"I have found my milk, since I commenced feeding ensilage with an addition of ten per cent. of mill feed, to produce very rich cream, giving one pound of butter to sixteen pounds of milk (although my herd is one-third common cows). The butter is as rich in color as if the cows were fed on June grass.

"Fodder corn is by no means the best for ensilage. Clover stands first, rye next, cut when the blossoms first appear, next all the small grains and all the grasses. Fodder corn is principally used because so large a tonnage can be obtained from an acre, and what it lacks in albuminoids can so cheaply be

supplied. The weight which is placed on the ensilage is not needed after the compression is perfected, as the interstices have then become filled with carbonic acid gas and no air can enter.

"In preparing to feed ensilage I take off the weight on three or four feet in width of surface — remove the plank and cut down with a hay knife so as to enable me to get what is wanted for one day in mild weather and two days in winter — take it to the feeding floor and cover it with a blanket. In twelve to twenty-four hours fermentation commences again, or as soon as the carbonic acid gas is driven off by the handling and the atmospheric air again surrounds it. I like to have it warm up a little, so my cows can have a good warm breakfast. The first fermentation after being removed from the silo produces spirit, and it gives out a strong smell of alcohol. When this fermentation commences it should be fed, as the next step would be acetic acid and the next putridity. So you see it must be fed on the spot.

"When placed in the silo the first fermentation is vinous, and at this point the pressure stops all action by the formation of carbonic acid gas, which, being heavier than air, fills every space in the silo which was filled by air when the vinous fermentation commenced.

"Frost does not affect the ensilage in the silo. I leave the bank I am cutting down uncovered from day to day, and with the thermometer at 6° below zero it does not freeze at all. I suppose the carbonic acid gas prevents the action of frost. The ensilage is quite moist, and cattle fed on it drink very little water. I feed my cows fifty pounds per day, with ten pounds of red top hay and six pounds of mill feed, and they kick and caper like colts turned out for exercise."

Now in reference to this gentleman's silo. He thinks the deeper you make it the better. The first one he made was twelve feet deep, but he told me he intended to make it sixteen feet deep. He has taken a great interest in the silo built at Little Falls, New York, and he wished me to see Mr. Willard and find out what sat isfaction it had given. It is the largest silo in the United States. He thinks farmers lose considerable by not feeding their stock ensilage. The cost is about ten cents a cubic foot. The capacity is fifty pounds to the cubic foot. So any farmer that wishes to build one can easily figure what the cost will be.

W. D. Hoard — What is ensilage? How does it act on the animal? How does it enter into the animal economy? I will give you a simple comparison. Way back, twenty-five years ago, every one of you gentlemen remember well when we sat down to a delicious dish of corn in the summer, and remember as we ate it how we relished it. How we thought to ourselves if we could only have next winter a good delicious dish of green corn how toothsome it

would be. In the first place, our mothers strove to fill that want the best they could, and so they went to work and dried some for us. But it did not taste the same as when we ate it in the summer. Then came science and canned this green corn, and now any one can sit down to his meal in midwinter with a delicious dish of green corn. So, gentlemen, ensilage is nothing more than canned corn fodder, and if you reflect how grateful to our animal economy is our canned vegetable food, you will have a little sympathy for the cow.

Pres. Favill — All enterprising farmers of this country will before long feed their stock largely in this way.

Hon. X. A. Willard — It is not well to have a silo too large, because at the time of putting in the corn fodder it has got to be done quickly. Mr. Burrel's silo is divided. It is twenty-seven feet long, twenty feet deep and sixteen feet broad. He has two silos of that kind, so that when he commences to cut his corn he can fill one, and if it is bad weather put on the stone and then go to the other. He has found that his silo, although twenty feet high, is hardly high enough. He has several men to help him, and as the corn fodder is thrown in, they stamp it down. Next year he is going to put a horse in to do this work. He filled the silo twenty feet high and then put on weights that pressed the ensilage down several feet. So you see if you made it twenty feet high you would not get more than twelve or thirteen feet of ensilage. Twenty-five feet is none too high, because a person can't get in without about five feet of space to work in. His building is of stone, and it is built against a very high bank. Our people are not going to build with stone but are intending to use this concrete. You can build them cheaper of this. All you have to do is to make your box and then throw in your cement and it soon hardens.

Mr. Burrel feeds his cows from fifty to sixty pounds a day. To his dry cows he gives no other food. To his milch cow he adds a feed of meal and some other ground grain. He has thirty-five cows and they will eat about six tons each of ensilage in the winter. He thinks that seven acres of corn fodder will carry his thirty-five cows two hundred days, and if he feeds sixty pounds to each cow, she will eat six tons of fodder during the winter.

Q. His cost was eighty cents a ton?

A. Yes; he did everything at arms length and it cost him more

than it ought to. There was a difficulty in cutting his fodder. The Eastern cutter is good for nothing, as it does not cut fast enough, so he discarded it and got the Fulton cutter. This cutter needs considerable power and is costly. I was talking with him before I came out here and he says there is a machine for cutting rags that cuts very fast, and he thinks that will be the kind of cutter in general use. He would advise no one to get this Eastern machine. The English machine can be furnished for about $75.

Q. Would it not be better for men to club together and do their cutting as they do their threshing?

A. Yes, I think so.

President Favill — I think the cutter on exhibition in the lower room is just the thing we want. This English machine is manufactured in Racine, but the patent was brought over from Canada and this one down stairs may or may not be the same thing.

X. A. Willard — Possibly it may be.

REPORT OF COMMITTEE ON RESOLUTIONS.

Mr. President: The committee appointed to draft resolutions expressive of the sense of this association respectfully submit the following:

WHEREAS, The dairy interest of Wisconsin has become the leading branch of farm production, and this great interest is seriously menaced and in danger of being ruined by the manufacture of large quantities of oleomargarine, sueine and other adulterations disguised to take the place of genuine butter, which find their way into the general market and are placed before the consumer as pure butter, greatly to the injury of the butter makers of the state, therefore,

Resolved, That in view of these facts and their bearing on the great interests we represent, this association most earnestly requests at the hands of the present legislature, the passage of a law making the vending in a retail way, unless each package is plainly branded with its true character, of butter or cheese which contains any substance other than pure butter, except salt and coloring matter, a misdemeanor to be punished by fine or imprisonment or both, at the discretion of the court. To make such a law

thorough and effective, we further ask that a commission be created, with power to inspect at will, any butter or cheese offered for retail sale within the state, and if found adulterated within the meaning of such law, then the commission shall prosecute the vendor or vendors of such compound to the full extent of such law. We hereby further recommend that as mixing oleomargarine, lard or other fats with butter and cheese, and selling the same to the consumer as dairy products, manifestly works great injustice to the dairy interest of this state, which has taken long years of labor and large investments of capital to establish the high reputation we now unquestionably possess for honest dairy products, therefore,

Resolved, That we recommend to every dairyman in this state to dissolve all business relations with every manufacturer or dealer, in this state or elsewhere, known to be engaged in such mixture.

Resolved, That we hereby tender to the citizens of Waukesha our hearty thanks for the generous welcome and kindly aid in making our convention successful.

Resolved, That the heartfelt thanks of the association are due and are heby extended to the Chicago & Northwestern, Chicago, Milwaukee & St. Paul, Wisconsin Central, and Milwaukee, Lake Shore & Western railways, for their generous and magnanimous reduction of fare to those attending the conventions.

Resolved, That we especially thank the officers of this association for the able and discreet management of the business of this association.

HIRAM SMITH,
CHARLES R. BEACH,
W. D. HOARD.

After considerable discussion, Col. Hinckley, of Oconomowoc, moved the adoption of the resolutions. Seconded by Chester Hazen, of Ladoga.

Resolutions adopted unanimously.

REPORT OF COMMITTEE ON NOMINATION OF OFFICERS.

Mr. President: Your committee on the nomination of officers for the ensuing year would respectfully recommend the following:

For President — Chas. R. Beach, Whitewater.

For Secretary — D. W. Curtis, Fort Atkinson.

For Treasurer — O. P. Clinton, Waukesha.

The vice presidents to be all of the ex-presidents.

CHESTER HAZEN,
J. C. BAMFORD,
H. A. CONGAR,
E. P. INGALLS,
C. P. CROSSFIELD.

W. D. Hoard moved that the report be received and adopted. Carried.

REPORT OF SECRETARY.

Mr. President: At the date of last year's report there were $11.22 in my hands.

I have paid out the past year, for stationery, stamps, freight on reports, etc., etc., $73.52.

An itemized bill has been furnished the Executive Committee.

At a meeting of the Executive Committee at Milwaukee, in November, it was voted to pay the expenses hereafter of those attending the executive meetings.

Orders will be drawn for those attending the meeting in November.

This is the first expense of the kind ever paid by the association since its organization in 1872.

Respectfully submitted,

D. W. CURTIS.

TREASURER'S REPORT.

1881. RECEIPTS.

January 15.	On hand from last year	$19 26
January 15.	Received for membership tickets	186 00
January 15.	Received for entries	15 50
July 20.	Received for state treasurer	100 00
September 3.	Received for state treasurer	200 00
January 11.	Received from S. Favill unexpended money	42 03
	Total received	$562 79

DISBURSEMENTS.

January 15.	Paid W. D. Hoard, printing bill	$21 50
January 15.	Paid board bill (short hand reporters)	4 25
January 15.	Paid Mrs. Kelly, reporter	29 86
January 15.	Paid M. Y. Park, printing bill	6 75
January 16.	Paid D. W. Curtis, services as secretary	50 00
January 16.	Paid premiums	9 00
January 31.	Paid engravings on cup	3 90
July 20.	Paid S. Favill	100 00
September 4.	Paid S. Favill	200 00
December 17.	Paid D. W. Curtis, office expenses	70 00
	Total disbursed	$495 26
	Total receipts	$562 79
	Total disbursements	495 26
	Balance in treasury	$67 53

Respectfully submitted,

O. R. CLINTON, *Treasurer.*

The money paid S. Favill was for butter and cheese purchased for the association for experimenting, etc.

REPORT OF COMMITTEE ON DAIRY GOODS AND MANUFACTURES.

Mr. President: Your committee, who were appointed to examine the dairy utensils, beg leave to submit the following report:

CLASS VIII.

CHEESE MAKING.

For the best display of apparatus for making cheese, $10. There were no exhibitors.

CLASS IX.

BUTTER MAKING.

For the best display of butter making utensils, $10. Cornish & Curtis, Fort Atkinson, were awarded the premium. They exhibited rectangular and square box churns, Eureka and Lever Butter Workers, butter trays, etc.

CLASS X.

CREAM RAISING.

For the best display of apparatus for raising cream, $5. John Boyd, 199 Lake street, Chicago, was awarded this premium on the Cooley Creamer, or the submerged process of setting milk. He exhibited a Cooley Creamer cream can, strainer, etc.

James Murphey, of Prospect Hill, exhibited a Ferguson Bureau Creamer, which we have had no chance to test the merits of, but think it worthy of trial.

CLASS XI.

BUTTER COLOR.

For the best display of butter color, $3. Awarded to F. B. Fargo & Co., Lake Mills. W. H. Hamersly, Geneva Lake, made a fine display of butter color. Your committee have no way of judging the relative merits of the two colors, and decline to decide which is the best.

CLASS XII.

BUTTER PACKAGES.

For the best package for shipping packed butter, $3. Awarded to E. E. Bolles & Co., West Depere. Leonard Lakin, Fort Atkinson, exhibited the Chatauqua tin lined butter package, which we highly commend for certain trades.

CLASS XIII.

For the best package for shipping print butter, $5. No exhibitors.

CLASS XIV.

PRESS OR MOULDS.

For the best press or moulds for marking print butter, $2. Awarded to R. Cunnington & Co., Des Moines, Iowa. They also exhibited a churn. Their presses and butter moulds are very desirable, and should be in the hands of every butter maker who wishes a nice print of butter.

Charles P. Willard & Co., 20 La Salle street, Chicago, exhibited a feed cutter, steam engine, and a case of Bradley Butter Boxes. There was no premium offered on the exhibit. We consider it entitled to the highest recommendation. The engine was well and substantially made, and the feed cutter as good as any we have seen.

GEO. LAWRENCE, JR.,
A. H. WHEATON,
B. HOLDEN.

REPORT OF COMMITTEE ON BUTTER AND CHEESE.

Mr. President—Your committee, who were appointed to examine the butter and cheese, beg leave to submit the following report:

CLASS I.

PREMIUMS ON CHEDDAR CHEESE.

The association offered a premium of $50.00, with entry fees added, making $58.50, to be divided among exhibitors in proportion to the number of points obtained by each, whose exhibits should be awarded 44 points or over, in a scale of 50 points.

No. 2.	S A. Rickmeier, Plymouth	44	points.
4.	H. J. Bumford, Plymouth	45 1/3	"
6.	Chester Hazen, Brandon	46 2/3	"
9.	H. A. Congar & Son, Whitewater	47	"
12.	Olin & Clinton, Waukesha	44	"
13.	E. P. Ingalls, Milford	46 1/3	"
14.	Olin & Clinton, Waukesha	44	"
15.	Adolph Reim, Franklin	44	"
17.	F. C. Reinking, Franklin	45	"

CLASS II.

FANCY SHAPED CHEESE.

Best exhibition of "Young America Cheese"	$5 00
Best exhibition of Goudas	5 00
Best exhibition of Champions	5 00
Best exhibition of Edams	5 00

No. 42. Fred Fasse, Johnsonville.

CLASS III.

SPECIAL PREMIUM.

By Geo. S. Hart & Howell, 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 made cheese.

No. 48. H. A. Congar & Son, Whitewater ..... 48 points.

NOTE. — This cup must be won three years in succession by one person, to retain the same permanently. It has been won by A. H. Wheaton, Auroraville, Olin & Clinton, Waukesha, and W. S. Baker, Cold Spring.

CLASS IV.

PREMIUM ON BUTTER.

The association offered a premium of $50.00, with entry fees added, making $55.50, to be divided among exhibitors in proportion to the number of points obtained by each, whose exhibits should be awarded 44 points or over in a scale of fifty points.

No. 55.	C. R. Beach, Whitewater	50	points.
56.	H. A. Congar & Son, Whitewater	46	"
57.	W. Le Fevre, Eagle	44 2/3	"
59.	Geo. Lawrence & Son	44	"
61.	J. B. Duncan, Baraboo	44	"

CLASS V.

PRINT BUTTER.

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

No. 75. Miss Frankie Tenney, Waukesha, 1st premium.

No. 76. Miss Frankie Tenney, Waukesha, 2d premium.

CLASS VI.

GRANULATED BUTTER.

For the best sample granulated butter..... $3 00
Second best..... 2 00

Granulated butter may be exhibited in fruit cans.

No. 89. H. A. Congar & Son, 1st premium.

No. 87. Miss Frankie Tenney, 2d premium.

CLASS VII.

COUNTY EXHIBITION.

For the best and largest exhibition of dairy products from one county, $20 00

Awarded to Sheboygan county. H. K. Loomis, Sheboygan Falls, exhibitor.

We have examined the butter and cheese bought by the association, which has been kept in cold storage and curing rooms to test the keeping qualities of each, and find most of it in very good shape.

Respectfully submitted,

A. H. BARBER, Chicago,
IRA M. STRONG, Sheboygan Falls.
R. F. MCCUTCHEN, Whitewater.

REPORT OF CHESTER HAZEN ON THE MANUFACTURE OF CHEESE.

In regard to the cheese made by me in June and July, 1880, for the purpose of testing the keeping qualities of the different ways of manufacturing, I will first give some idea of my process of making, which is simply to draw the whey from the curd when sweet, but after the curd has been sufficiently cooked so the whey will separate from the curd freely.

When the curd and whey has been brought to a scalding heat of one hundred degrees Fahrenheit, and the mass thoroughly stirred, I let the curd settle and form a mass on the bottom of the vat, and hold it in that condition until the curd becomes firm enough to run off the whey, which point can be decided only by practical experience. The conditions of the milk, when the rennet is put in, have much to do with the development of the curd.

I draw the whey off from the curd when sweet, and drop one end of the vat so as to let the curd drain by making a channel through the center of the vat, by moving the curd from the center. When this is done, cover the curd with cloths or a cover over the top of the

vat so as to keep it warm and of an even temperature. I hold the curd in this position until the whey that drains from it has developed a considerable acid, and the curd will stand the hot iron test. I then cut the curd in convenient sized chunks to handle, and run it through a curd mill and salt it. When sufficiently cool, put to press.

If there is tainted milk in the vat, the curd, when packed down in the vat after the whey is drawn off, will ferment, and the extent of the fermentation will be in proportion to the amount of tainted milk in the vat. In such case, it is best to develop a little more acid in the curd before salting or running curd through the mill.

The much-talked-of Arnold's sweet curd system of making cheese differs from the one already described only by keeping the curd thoroughly stirred up both before and after the whey is run off, instead of letting it mass together and running it through a curd mill.

In order to test the different processes, I divided the curd in one vat in the center, letting one-half of it pack down and running it through the curd mill, as first described, and kept the other half stirred up and aired, according to Arnold's theory.

June 30, 1880, I made four cheeses as above described, two of the ground curd and two of the loose curd. One of each was put in cold storage when about four weeks old, and one of each put in a cellar at the same time, and kept there until January, 1881. The judges on cheese at the annual dairymen's meeting, in Waukesha, in January, awarded the two June cheeses, kept in cold storage, 42 points in a scale of 50 as perfection; and the ground curd cheese, kept in cellar, was awarded 39 points, and the loose curd cheese 38 points.

About July 24 I made four more, same as in June. The cold storage cheeses were awarded 47 points, and the ground curd cheese in cellar was awarded 44⅓ points, and the loose curd cheese 44 points.

At the annual meeting at Waukesha, I called the attention of several of the best judges of cheese that I could find to those cheese, the judges not knowing anything about the different processes of making. Among the gentlemen named was Prof. X. A. Willard, of New York, and in three cases out of the four pairs of cheeses, kept in cold storage and cellar, the preference was given to the ground curd cheese.

This test corresponds with my former experience and preference in favor of the Cheddar, or ground curd theory, especially in warm weather and when we have any tainted milk to handle. But with a small quantity of milk and cool weather, it is not always practicable.

President Favill — Some time last spring, at a meeting of the Executive committee, it was thought best to buy some cheese and butter and try the keeping qualities of each.

Some of the cheese was made on the sweet curd plan, and some on the acid.

Part of the cheese was kept in cold storage, and part of it in curing rooms.

The butter was all kept in cold storage, and was supposed to be prime butter when put in.

The cheese was purchased in Jefferson, Fond du Lac and Sheboygan counties. Twenty-four cheeses and five tubs of butter.

I paid out $257.47 for butter and cheese, and the expense attending the collecting it, paying freight, etc.

It has been on exhibition, and you have all noticed the condition in which it is, how it has kept, etc.

This cheese will be sold, and the money used to pay the premiums of our dairy fair — as far as it goes. This cheese, I understand, has been examined by the judges, and I suppose the secretary will publish the tables in the report, so we all can see how it grades.

The convention will now adjourn *sine die*.

TABLES OF BUTTER AND CHEESE.

TABLE *showing the entries of cheese in class* 1, *and the award of the judges, on a scale of* 50 *or perfection.*

NAME OF EXHIBITOR.	Number of Package.	Flavor, 15.	Quality, 15	Texture, 10.	Style, 6.	Color, 4.	Total, 50.	Grand total.	Average judgment.
A. H. Wheaton.....	1	7	8	7	6	2	30	109	36⅓
		10	10	6	6	4	36		
		11	14	8	6	4	43		
S. A. Rickmeier.....	2	13	13	8	6	4	44	132	44
		13	13	8	6	4	44		
		13	13	8	6	4	44		
H. J. Bumford.....	3	10	13	8	6	4	41	124	41⅓
		12	10	8	6	4	40		
		12	13	8	6	4	43		
H. J. Bumford.....	4	13	14	10	5	4	46	140	46⅔
		14	14	9	6	4	47		
		14	14	9	6	4	47		
Chester Hazen.....	5	12	12	8	6	4	42	129	43
		12	12	8	6	4	42		
		14	12	9	6	4	45		
Chester Hazen.....	6	14	14	8	6	4	46	140	46⅔
		14	14	9	6	4	47		
		14	14	9	6	4	47		
J. A. Reik.....	7	6	10	10	6	4	36	118	39⅓
		8	14	10	6	4	42		
		9	12	9	6	4	40		
Geo. Hartle.....	8	8	11	6	4	3	32	103	34⅓
		10	10	6	4	4	34		
		9	11	7	6	4	37		
H. A. Congar & Son...	9	15	14	9	6	4	48	141	47
		15	14	10	6	4	49		
		13	13	8	6	4	44		
Thomas Steel.....	10	12	11	8	5	4	40	119	39⅔
		12	10	6	6	4	38		
		13	11	8	6	3	41		
Thomas Steel.....	11	12	11	8	5	4	40	120	40
		12	12	6	6	4	40		
		13	11	7	6	3	40		
Olin & Clinton.....	12	13	12	9	6	4	44	136	45⅓
		13	13	10	5	4	45		
		14	14	9	6	4	47		
E. P. Ingalls	13	13	13	9	6	4	45	132	44
		13	12	9	6	4	44		
		12	14	8	5	4	43		
Olin & Clinton.....	14	14	13	7	6	4	44	132	44
		13	14	7	6	4	44		
		13	13	9	5	4	44		
Adolph Reim.....	15	12	12	9	6	4	43	132	44
		12	14	9	6	4	45		
		12	13	9	6	4	44		
M. N. Seward.....	16	11	12	8	6	4	41	122	40⅔
		10	12	10	6	4	42		
		10	12	8	5	4	39		
F. C. Reineking.....		13	13	9	6	4	45	135	45
		12	13	10	6	4	45		
		13	13	9	5	4	45		

TABLE *showing the entries of cheese in class* 3 *and the award of the judges.*

NAME OF EXHIBITOR.	Number of package.	Flavor, 15.	Quality, 15.	Texture, 10.	Style, 6.	Color, 4.	Total, 50.	Grand total.	Average judgment.
A. A. Wheaton	46	11	11	8	6	4	40	122	40⅔
		11	12	7	6	4	40		
		11	13	8	6	4	42		
S. A. Rickmeir	47	11	12	8	6	4	41	124	41⅓
		12	11	8	6	4	41		
		11	13	8	6	4	42		
H. A. Congar & Son	48	14	14	9	6	4	47	144	48
		14	14	9	6	4	47		
		15	15	10	6	4	50		
Olin & Clinton	49	13	13	8	5	3	42	125	41⅓
		13	14	8	6	4	45		
		12	11	7	5	3	38		
Olin & Clinton	50	14	14	8	6	4	46	139	46⅓
		14	14	8	6	4	46		
		15	13	9	6	4	47		

Table showing the entries of cheese, kept in cold storage and curing rooms, the months in which they were made, and the award of the judges.

MONTH IN WHICH THE CHEESE WAS MADE.	COLD STORAGE OR CURING ROOM.	Flavor, 15.	Quality, 15.	Texture, 10.	Style, 6.	Color, 4.	Total, 50.	Grand total	Average judgment.
June	Curing room	8	9	6	6	3	32	106	35⅓
		8	10	6	6	4	34		
		9	13	8	6	4	40		
June	Curing room	7	8	6	6	3	30	103	34⅓
		9	10	6	6	4	35		
		8	13	8	5	4	38		
June	Cold storage	13	13	10	6	4	46	133	44⅓
		12	12	8	6	4	42		
		13	13	9	6	4	45		
June	Cold storage	13	14	10	6	4	47	133	44⅓
		12	12	8	6	4	42		
		12	13	9	6	4	44		
July	Curing room	12	14	10	6	4	46	135	44¾
		11	14	10	6	4	45		
		12	13	9	5	4	44		
July	Curing room	12	14	10	6	4	46	137	45⅔
		12	14	10	6	4	46		
		11	15	9	6	4	45		
July	Cold storage	14	14	10	6	4	48	144	48
		14	14	10	6	4	48		
		13	15	10	6	4	48		
July	Cold storage	14	14	10	6	4	48	143	47⅔
		13	15	10	6	4	48		
		14	13	10	6	4	47		
August	Curing room	12	13	9	6	4	44	128	42
		13	12	10	5	4	44		
		11	12	8	5	4	40		
August	Curing room	11	13	10	6	4	44	133	44⅓
		12	14	9	6	4	45		
		12	14	9	5	4	44		
August	Cold storage	14	13	9	6	4	46	138	46
		13	13	9	6	4	45		
		13	14	10	6	4	47		
August	Cold storage	12	12	8	6	4	42	130	44⅓
		13	13	8	6	4	44		
		12	13	9	6	5	44		
October	Curing room	14	14	9	6	4	47	143	47⅔
		14	14	10	6	4	48		
		14	14	10	6	4	48		
October	Curing room	14	14	10	6	4	48	144	48
		14	14	10	6	4	48		

TABLE *showing the entries of butter in class* 4, *and the award of the judges.*

NAME OF EXHIBITOR.	Number of package.	Flavor, 20.	Grain, 15.	Salting, 5.	Color, 5.	Style of package, 5	Total, 50.	Grand total.	Average judgment.
Horatio Merriman.....	51	15	11	4	3	5	38	120	40
		17	13	5	4	5	44		
		15	11	4	3	5	38		
I. J. Edwards	52	10	12	4	3	5	34	109	36⅓
		17	13	5	4	5	44		
		11	9	3	3	5	31		
Stephen Gernon...	53	10	10	3	5	5	31	96	32
		13	10	3	3	5	34		
		10	10	3	3	5	31		
A. H. Wheaton....	54	15	10	3	4	5	29	113	37⅔
		15	10	3	4	5	37		
		14	11	3	5	5	37		
C. R. Beach.	55	20	15	5	5	5	50	150	50
		20	15	5	5	5	50		
		20	15	5	5	5	50		
H. A. Congar & Son....	56	18	13	5	5	5	46	138	46
		18	14	5	4	5	46		
		18	13	5	5	5	46		
W. Le Fevre	57	15	15	5	5	5	45	134	44⅔
		16	14	5	4	5	44		
		15	15	5	5	5	45		
Geo. Lawrence & Son ..	58	17	14	5	3	5	44	130	43⅓
		16	12	4	5	5	42		
		17	14	5	3	5	44		
Geo. Lawrence & Son ..	59	16	15	5	4	5	45	133	44⅓
		17	13	5	4	5	44		
		15	15	5	4	5	44		
Capen Bros	60	13	14	4	3	4	38	120	40
		18	13	4	4	5	44		
		13	13	4	3	5	38		
J. B. Duncan....	61	18	14	4	4	4	44	132	44
		17	13	5	4	5	44		
		18	14	4	4	4	44		
Hiram Smith	62	14	13	4	4	5	40	120	40
		14	13	4	4	5	40		
		14	13	4	4	5	40		
John K. Ichminster....	63	12	14	3	3	4	36	108	36
		12	10	4	4	5	35		
		12	14	3	3	5	37		

NOTE.—A. J. W. Pierce, of Milwaukee, was judge on butter, in place of R. F. McCutchen.

TABLE *showing the entries of butter kept in cold storage, the month in which it was made and the award of the judges.*

MONTH IN WHICH IT WAS MADE.	Flavor, 20	Grain, 15.	Salting, 5.	Color, 5.	Style of package, 5.	Total, 50.	Grand total.	Average judgment.
June	17	15	5	5	5	47	133	44⅓
	16	14	4	4	2	40		
	18	15	5	5	3	46		
June	18	14	5	4	4	45	132	44
	18	14	4	4	3	43		
	17	14	5	5	3	44		
July	17	14	4	4	5	44	130	43½
	17	14	4	3	4	42		
	16	14	5	5	4	44		
July	15	14	5	4	5	43	129	43
	16	14	4	4	4	42		
	16	14	5	5	4	44		
August	18	15	5	5	3	46	135	45
	17	14	5	5	2	43		
	18	15	5	5	3	46		

NOTE.—The marking of each judge is put down in the tables in the order in which they are named: Barber first, McCutchen second and Strong third. To get the average judgment, the grand total is divided by three, the number of judges, which shows how near each entry gets to fifty, or perfection.

APPENDIX.

EXPORTS OF BUTTER AND CHEESE

During the years ending June 30, 1865, and from 1867 to 1880, inclusive, as obtained from the Bureau of Statistics, Washington.

NEW YORK.

YEARS ENDED JUNE 30.	BUTTER.		CHEESE.	
	Pounds.	*Dollars.*	*Pounds.*	*Dollars.*
1865	19,629,950	6,584,336	51,350,718	11,356,779
1867	4,077,310	952,272	50,862,072	7,650,154
1868	1,491,305	419,996	50,337,918	6,899,788
1869	941,065	344,560	39,624,269	6,376,818
1870	1,423,483	415,136	56,980,892	8,824,987
1871	3,277,174	672,063	63,109,309	8,670,163
1872	6,631,814	1,270,698	65,421,331	7,649,085
1873	3,746,355	774,896	79,328,814	10,337,382
1874	3,620,653	899,041	88,315,565	11,624,406
1875	4,592,975	1,126,349	96,677,521	13,131,226
1876	3,757,075	887,749	91,447,721	11,515,632
1877	16,771,663	3,394,718	103,251,661	12,199,893
1878	18,187,954	3,201,081	117,484,038	13,375,856
1879	32,031,365	4,428,995	131,852,419	11,779,423
1880	31,061,610	5,179,071	119,760,142	11,505,321

BOSTON AND CHARLESTON.

1865	774,773	315,182	552,111	116,399
1867	224,706	64,370	189,839	34,593
1868	138,244	41,314	203,493	30,074
1869	96,941	35,890	65,117	11,601
1870	128,861	37,875	40,152	7,623
1871	253,591	60,292	201,446	26,433
1872	349,167	68,098	259,107	30,473
1873	399,916	84,583	395,595	61,351
1874	231,236	60,649	248,507	32,715
1875	625,134	163,298	287,550	43,262
1876	315,696	73,318	493,258	62,850
1877	2,284,619	514,247	1,172,522	150,177
1878	1,015,037	204,357	2,334,384	244,713
1879	4,220,009	628,426	3,373,404	268,383
1880	6,714,095	1,242,311	4,335,502	408,405

Exports of Butter and Cheese during the years ending June 30, 1865, *and from* 1867 *to* 1880, *inclusive*— continued.

PHILADELPHIA.

YEARS ENDED JUNE 30.	BUTTER.		CHEESE.	
1865	322,713	113,721	54,546	11,188
1867	144,085	31,384	57,428	10,731
1868	53,703	12,804	4,930	781
1869	17,783	6,259	9,604	1,853
1870	58,440	13,128	25,382	5,018
1871	94,760	19,401	15,702	2,526
1872	76,712	11,196	122,697	16,284
1873	35,024	6,514	188,593	29,184
1874	38,605	8,509	1,390,612	153,447
1875	575,000	65,661	2,541,471	280,893
1876	141,609	27,823	2,198,114	262,053
1877	1,141,224	218,651	1,456,868	183,980
1878	1,521,581	290,553	1,998,467	255,402
1879	1,233,824	212,785	3,115,039	254,445
1880	468,137	73,345	225,152	20,547

BALTIMORE.

1865	166,876	56,032	200,248	42,770
1867	156,438	39,910	199,135	30,544
1868	97,589	23,313	147,171	23,167
1869	81,459	25,690	110,551	21,118
1870	118,636	30,694	65,116	11,644
1871	100,793	23,282	75,068	11,572
1872	160,849	28,487	121,131	14,278
1873	31,412	7,441	147,885	21,830
1874	38,057	10,475	67,647	9,702
1875	63,134	14,191	76,370	12,665
1876	56,687	13,159	58,155	8,152
1877	98,362	18,773	77,172	11,306
1878	72,499	12,088	161,357	19,955
1879	121,929	16,818	199,094	17,119
1880	84,275	14,392	83,957	8,152

EXPORT *of Butter and Cheese by countries during the year ending June* 30, 1880, *as obtained from the Bureau of Statistics, Washington.*

		Quantities in pounds.	Values in dol'rs
Mexico	Butter	84,522	19,258
British Honduras	Butter	53,312	11,674
Cuba	Butter	283,779	54,304
Cuba	Cheese	140,022	21,226
British West Indies	Butter	1,359,944	236,306
British West Indies	Cheese	588,116	67,898
Hayti	Butter	344,663	71,836
Hayti	Cheese	114,100	16,273
Porto Rico	Butter	119,416	19,472
Porto Rico	Cheese	333,591	41,187
French West Indies	Butter	103,009	16,545
Danish West Indies	Butter	175,945	30,323
Dutch West Indies	Butter	110,007	22,681
San Domingo	Butter	87,996	18,348
San Domingo	Cheese	55,784	7,584
Brazil	Butter	517,589	124,727
United States of Colombia	Butter	252,135	54,127
Venezuela	Butter	311,477	67,477
British Guiana	Butter	109,166	18,222
British Guiana	Cheese	204,975	22,050
Dutch Guiana	Butter	61,304	10,697
China	Butter	36,596	8,864
Japan	Butter	116,814	26,984
Japan	Cheese	26,456	4,101
Hawaiian Islands	Butter	104,138	23,310

VALUES *of Butter and Cheese exported from the United States during the years ended June* 30, 1850, 1860, 1870 *and* 1880, *in the order of magnitude for the year ended June* 30, 1880.

ARTICLES.	1850.	1860.	1870.	1880.
Cheese	*b* $1,215,463	$1,565,630	$8,881,934	$12,171,720
Butter	...	1,144,321	592,229	6,690,687

b Includes butter.

VALUES *of the products of Butter and Cheese exported from the United States during the ten years from* 1871 *to* 1880, *inclusive.* [Mixed gold and currency values.]

ARTICLES.	YEAR ENDED JUNE 30.									
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Butter	$853,096	$1,498,812	$952,919	$1,092,381	$1,506,996	$1,109,496	$4,424,616	$3,931,822	$5,421,205	$6,690,687
Cheese	8,752,990	7,752,918	10,498,010	11,898,995	13,659,603	12,270,083	12,700,627	14,103,529	12,579,968	12,171,720

STATEMENT *showing the average export prices of Butter and Cheese for each of the ten years ended June* 30, *from* 1871 *to* 1880, *inclusive.*

ARTICLES.	Unit of quantity.	1871.	1872.	1873	1874.	1875.	1876.	1877.	1878.	1879.	1880.
		Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
Butter	pound.	.215	.194	.211	.250	.237	.239	.206	.180	.142	.171
Cheese..... ..	pound.	.138	.117	.130	.131	.135	.125	.118	.114	.089	.095

QUANTITIES *and Values of Butter and Cheese of Domestic Production Exported from the United States from* 1821 *to* 1880, *inclusive.*

YEARS ENDED.	EXPORTS OF—				
	Butter.		*Cheese.*		*Total Butter & Cheese.*
	Quantities.	Values.[1]	Quantities.	Values.[1]	Values.[1]
September 30.	*Pounds.*	*Dollars.*	*Pounds.*	*Dollars.*	*Dollars.*
1821	1,069,024	.....	766,431	.....	190,287
1822	1,149,783	.....	722,548	.....	221,041
1823	1,171,701	.....	591,689	.....	192,778
1824	1,386,232	.....	933,158	.....	204,205
1825	1,442,197	.....	1,230,104	.....	247,787
1826	1,176,579	.....	735,399	.....	207,765
1827	1,148,480	.....	641,385	.....	184,049
1828	1,184,329	.....	688,548	.....	176,354
1829	969,137	.....	916,695	.....	176,205
1830	899,396	.....	688,241	.....	142,370
1831	1,728,212	.....	1,131,817	.....	364,796
1832	1,501,686	.....	1,391,853	.....	290,820
1833	1,346,364	.....	1,213,092	.....	258,452
1834	1,084,960	.....	819,567	.....	190,099
1835	684,624	.....	887,000	.....	164,809
1836	361,395	.....	486,234	.....	114,033
1837	281,939	.....	411,338	.....	96,176
1838	495,108	.....	664,660	.....	148,191
1839	424,609	.....	519,017	.....	127,550
1840	1,177,639	.....	723,217	.....	210,749
1841	3,785,993	.....	1,748,471	.....	504,815
1842	2,055,133	.....	2,456,607	.....	388,185
June 30.					
1843[2]	3,408,247	.....	3,440,144	.....	808,968
1844	3,251,952	.....	7,343,145	.....	758,829
1845	3,587,489	.....	7,941,187	.....	878,865
1846	3,426,660	.....	8,675,390	.....	1,063,087
1847	4,214,433	.....	15,637,600	.....	1,741,700
1848	2,751,086	.....	12,913,305	.....	1,361,368
1849	3,406,242	.....	17,433,682	.....	1,654,157
1850	3,876,175	.....	13,020,817	.....	1,215,463
1851	3,994,542	.....	10,361,139	.....	1,124,652
1852	2,222,264	.....	6,650,420	.....	779,391
1853	2,658,911	.....	3,763,932	.....	862,343
1854	3,774,634	.....	7,003,974	.....	1,258,393
1855	2,315,249	418,723	4,846,568	514,034	.....
1856	2,936,491	580,286	8,737,029	887,705	.....
1857	3,141,592	593,084	6,453,072	647,423	.....
1858	3,082,117	541,863	8,098,527	731,910	.....
1859	4,572,065	750,911	7,103,323	649,309	.....
1860	7,640,914	1,144,321	15,515,799	1,565,630	.....
1861	15,531,381	2,355,985	32,361,428	3,321,631	.....
1862	26,691,247	4,164,344	34,052,678	2,715,892	.....
1863	35,172,415	6,733,743	42,045,054	4,216,804	.....
1864	20,895,435	6,140,031	47,751,329	5,638,007	.....
1865	21,559,892	7,292,715	53,154,318	11,697,746	.....
1866	3,806,835	1,267,851	36,411,985	6,036,828	.....

[1] Value of butter and cheese not separately stated from 1821 to 1854. [2] Nine months.

Quantities and values of Butter and Cheese of Domestic Production exported from the United States from 1821 *to* 1880, *inclusive* — continued.

YEARS ENDED.	EXPORTS OF —				
	Butter.		*Cheese.*		*Total Butter & Cheese.*
	Quantities.	Values.[1]	Quantities.	Values.[1]	Values.[1]
June 30.	*Pounds.*	*Dollars.*	*Pounds.*	*Dollars.*	*Dollars.*
1867	4,912,355	1,184,367	52,382,127	7,893,535	.....
1868	2,071,873	582,745	51,097,203	7,010,424	.....
1869	1,324,332	484,094	39,960,367	6,437,866	.....
1870	2,019,288	592,229	57,296,327	8,881,934	.....
1871	3,965,043	853,096	63,698,867	8,752,990	.....
1872	7,746,261	1,498,812	66,204,025	7,752,918	.....
1873	4,518,844	952,919	80,366,540	10,498,010	.....
1874	4,367,983	1,092,381	90,611,077	11,898,995	.....
1875	6,360,827	1,506,996	101,010,853	13,659,603	.....
1876	4,644,894	1,109,496	97,676,264	12,270,083	.....
1877	21,527,242	4,424,616	107,364,666	12,700,627	.....
1878	21,837,117	3,931,822	123,783,736	14,103,529	.....
1879	38,248,016	5,421,205	141,654,474	12,579,968	.....
1880	39,236,658	6,690,687	127,553,907	12,171,720	.....

[1] Value of butter and cheese not separately stated from 1821 to 1854.

EXPORTS OF BUTTER.

(*American Dairyman*, *April* 7, 1881.)

The following are the exports of butter from New York to the under-mentioned ports since May 1, 1880 (beginning of the trade year), and for the week ending April 6:

	This week.	Previously.	Total.
Liverpool	10,250	10,830,463	10,840,713
London	.....	945,400	945,400
Glasgow	31,615	6,563,229	6,594,844
Bristol	.....	1,781,602	1,781,602
Cardiff	.....	972,089	972,089
Hull	.....	111,980	111,980
Newcastle	2,950	171,076	174,026
Havre	.....	340,529	340,529
Hamburg	.....	1,253,301	1,253,301
Bremen	.....	1,048,247	1,048,247
Other ports	127,470	4,090,307	4,217,777
Totals	172,285	28,018,223	28,280,508

EXPORTS OF CHEESE.

The following are the exports from New York to the under-mentioned ports since May 1, 1880 (beginning of the trade year), and for the week ending April 6:

	This week.	Previously.	Total.
Liverpool	466,083	81,966,822	82,432,860
London	7,850	13,117,806	13,125,656
Glasgow	92,822	19,224,958	19,317,780
Bristol	32,100	12,046,561	12,078,661
Cardiff	.....	1,277,721	1,277,721
Hull	.....	375,841	375,841
Newcastle	10,752	592,660	603,412
Havre	.....	121,145	121,145
Hamburg	.....	119,923	119,923
Bremen	.....	580,043	580,043
Other ports	38,250	2,746,261	2,784,511
Totals	647,812	132,169,741	132,817,553

EXPORTS OF OLEOMARGARINE.

The following are the exports of oleomargarine from New York to the under-mentioned ports since March 23, and for the week ending April 6:

	This week.	Previously.	Total.
Liverpool	8,450	857,340	865,790
London	.....	90,150	90,150
Glasgow	14,000	1,499,360	1,513,360
Bristol	.....	190,150	190,150
Rotterdam	101,080	6,463,269	6,564,349
Antwerp	34,000	520,450	554,450
Hamburg	.....	102,125	102,125
Bremen	.....	84,600	84,600
Other ports	10,850	612,538	623,388
Totals	168,380	10,419,982	10,588,362

BUTTER AND CHEESE MADE IN WISCONSIN,

During the year 1870, *as taken from the census report, also the amount made in* 1876, 1877, 1878, 1879 *and* 1880.

	1870.	1876.	1877.	1878.	1879.	1880.
	lbs.	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*
Butter.....	22,473,036	50,130,000	62,662,500	63,000,000	64,000,000	65,000,000
Cheese	1,591,798	17,000,000	21,250,000	24,000,000	25,000,000	27,000,000

From the best information to be obtained from prominent dairymen in all parts of the state the estimate of 1880 is made.

LIST OF CHEESE FACTORIES AND CREAMERIES,

With their Post Office Address.

COUNTIES AND NAME OF FACTORY OR PROPRIETOR.	P. O. ADDRESS.
BROWN.	
Jas. Bitchie Lawrence	West Depere.
A. Vander Heiden & Co	Wrightstown.
D. Benecke	Fon'enoy.
BUFFALO.	
William Fisher	Mondovia.
T. W. Bailey	Gilmanton.
A. Mosher	Gilmanton.
CALUMET.	
C. P. Skidmore	Stockbridge.
M. S. W. Scott	Brant.
O. R. Potter	Potter's Mills.
Writz Cheese Company	Hilb rt.
Platt Cheese Company	Hilbert.
CLARK.	
G. & J. Heuntzicher Factory	Greenwood.
COLUMBIA.	
Arlington Cheese Association	Dixon
COLUMBIA — continued.	
Wyocena Cheese Association	Wyocena.
Lodi Cheese Association	Lodi.
West Point Cheese Association	West Point.
Chas. Baker Cheese Association	Portage.
O. B. Prime & Co	Fall River.
Caledonia Cheese Company	Portage.
A. Chapman	Columbus.
Poynette Cheese Factory	Poynette.
H. M. Chapman's Creamery	———.
J. Whiting	Port Hope.
Randolph Cheese Factory	Randolph.
DANE.	
C. C. Pease	Belleville.
Wm. Fischer	Paoli.
Humphrey & Sherman	Mazomanie.
Black Earth Cheese Factory	Black Earth.
Dane Cheese Factory	Dane
A. S. Noyes' Cheese Factory	Waunakee.
W. J. Donald Cheese Factory	Mount Vernon.
Brooklyn Cheese Factory	Brooklyn.
John Fasher Cheese Factory	Mount Vernon.
John Ole & Co. Cheese Factory	Primrose.

DANE — continued.	
John Arian's Cheese Factory	North Bristol.
A. Chipman's Cheese Factory	Sun Prairie.
Sherman Bros. Cheese Factory	Windsor.
Olin, Crossfield & Co	Cambridge.
Kittle, Torguson & Co	Utica.
C. M. Prentice	Dane.
DODGE.	
Stapleton Cheese Co	Fox Lake.
R F. Ellis	Beaver Dam.
J. B. Cochrane Cheese Co.	Beaver Dam.
F. S. Jacobs	Atwater.
Wm. B McDonald	Danville.
G. R. Talbot	Juneau.
G. R. Talbot	Rolling Prairie.
G. R. Talbot	Emmett.
John Hoffman	Hustisford.
B. Bross	Hustisford.
H. Brue	Hustisford.
Mr. von Grunigen	Hustisford.
M. E. von Grunigen	Hustisford.
A. Graniger	Hustisford.
J. Graniger	Hustisford.
C. Wellow (3 factories)	Hustisford.
J. Seelgidurey	Hustisford.
Mr. Chrunkny	Hustisford.
S. Boss	Watertown.
Jacob Joss	Woodland.
J. Ealing	Woodland.
M. S. Barrett's Factory	Burnett.
S. Hammond	Lowell.
R. D. Calkins	Randolph.
Lebanon Cheese Co	Lebanon.
Lake Emily Cheese Co	Fox Lake.

FOND DU LAC.	
C. Hazen	Ladoga.
C. Hazen, Brandon Factory	Ladoga.
E. S. Jenkins' Factory	Rosendale.
E. Peebles	Peebles.
D. S. Treleven	Byron.
Wm. Berry	Peebles.
Fayette Bude	Oakfield.
M. Wookey	Oakfield.
Willis Lang	Waupun.
John Howard	Waupun.
H. C. Williams	Waupun.
Badley's C eese Co	Waupun.
M. R Stapleton	Waupun.
R. M. Stevens	Ripon.
J. H. Downing	Waupun.
J. Cronks	Waupun.
B. Bennett	Lamertine.
O. G. Parker	North Byron.
Fountain City, Wm. Berg	Peebles.
Ira Brown	New Cassel.
Bristol & Orvis	Oakfield.
L. F. Beedee	Oakfield.
Simon Arthur	Fond du Lac.
H. G. Parker	Fond du Lac.
J. A. Chitterling	Fond du Lac.
Ira Brown	Campbellsport.
GRANT.	
A.E. Morse	Bloomington.
Delos Abrahams	Bloomington.
Morse & Welch Factory	Bloomington.

LIST OF CHEESE FACTORIES AND CREAMERIES — continued.

COUNTIES AND NAME OF FACTORY OR PROPRIETOR.	P. O. ADDRESS.
GREEN.	
American.	
Melvin & Blair	Brooklyn.
F. Lehnherr	Dayton.
W. Green	Dayton.
Cheese Factory	Attica.
J. C. Zimmermann	New Glarus.
Cheese Manufacturing Co	New Glarus.
Cheese Manufacturing Co	Stewart P. O.
Cheese Manufacturing Co	Farmers' Grove.
Cheese Manufacturing Co	Monticello.
W. S. Wescott	Monroe.
G. O. Stearns	Monroe.
W. C. Gorham	Monroe.
Jos. Blumer	Monroe.
R. Karlen	Juda.
Swiss.	
J. Kundert, Sr	Monroe.
J. Kundert, Jr	Monroe.
J. U. Elmer	Monroe.
Dieitrich Freitag	Monticello.
Jost. Voegeli	Monticello.
D. Weiss	Monticello.
John Marty	Monticello.
John Weiss	Monticello.
Matt. Elmer	New Glarus.

COUNTIES AND NAME OF FACTORY OR PROPRIETOR.	P. O. ADDRESS.
GREEN — continued.	
Swiss.	
Paul Kundert	New Glarus.
B. Hoesly, Sr	New Glarus.
Math. Figy	New Glarus.
Sam. Hoesly	Oneco, Ill.
M. Zumbrunner	Monroe.
Limburger.	
N. Gerber	New Glarus.
Ott Bros. & Co	New Glarus.
Elmer Bros. & Co	New Glarus.
Stensey Bros	New Glarus
Nie, Bentner & Co	New Glarus.
Fred. Duester & Co	New Glarus.
David Duerst	New Glarus.
B. Kundert, Sr	New Glarus.
Adam Blumer	New Glarus.
F. Blum & Co	New Glarus.
John Boss, (3 factories)	Monticello.
Rhyner & Bable	Monticello.
D. Weiss	Monticello.
G. Witwer, Jr. (8 factories)	Monroe.
Reger Bros. (4 factories)	Monroe.
Gottlieb Beller (3 factories)	Monroe.
Jacob. Bross	Monroe.
Henry Trumphy	Shoey Mills.
Benedict Miller	Monroe.

GREEN LAKE.	
C. Hazen	Ladoga.
Grand Prairie Factory	Ladoga.
IOWA.	
Bloomfield Factory	Mineral Point.
JEFFERSON.	
Olin, Crossfield & Co	Oakland.
Fort Atkinson Factory	Oakland.
Clark & Reynolds	Hebron.
Whitney's Factory	Fort Atkinson.
Wright's Mill Factory	Hebron.
Cold Spring Cheese Co	Whitewater.
Old Cold Spring Factory	Whitewater.
New Cold Spring Factory	Whitewater.
Hebron Factory	Whitewater.
Palmyra Factory	Whitewat r.
Oak Hill Factory	Oak Hill.
M. N. Seward	Harvey.
Seward & Skinner	Aztalan.
Riverside Factory	Jefferson.
Faville Grove Factory	Lake Mills.
E. P. Ingalls	Milford.
Wm Galloway	Whitewater.
Thos. Bussey	Busseyville.
Greene's Corner Factory	Fort Atkinson.
Z. Wilson	Palmyra.
Concordia Cheese Company	Concord.
C. H. Hosington	Farmington.
H. C. Drake	Lake Mills.

JEFFERSON — continued.	
Merrick's Factory	Whitewater.
H. A. Hoffman, Creamery	Jefferson.
S. G. Westphall, Creamery	Fort Atkinson.
H. Merriman, Creamery	Fort Atkinson.
Rock Lake Creamery	Lake Mills.
Star Creamery	Lake Mills.
Krogville Cheese Company	Krogville.
Union Cheese Company	Lake Mills.
Koshkonong Cheese Company	Koshkonong.
Wm. P. Phillips	Lake Mills.
C. S. Cartwright, Cheese Factory	Rome.
H. E. Humphrey	Ixonia Center.
Burr Oak Creamery	Fort Atkinson.
L B. Root	Whitewater.
JUNEAU.	
D. C. Robinson	Mauston.
Wm. Kimball	Union Center.
F. O. Galla	Elroy.
Wm. Hale & Co	Mauston.
Robert Camp	Mauston.
F. O. Galla	Elroy.
John Sharf	Union Center.
Andrew Mills	Elroy.
I. Fleno	Elroy.
Wm. Robinson	Elroy.
J. J. Smith	New Lisbon.
J. J. Smith	Melvina.
J. J. Smith	Burns.
George Curtis & Co.	Mauston.
Millards Prairie Factory	Elroy.
D. C. Robinson & Co	Mauston.

LIST OF CHEESE FACTORIES AND CREAMERIES—continued.

COUNTIES AND NAME OF FACTORY OR PROPRIETOR.	P. O. ADDRESS.
KENOSHA.	
E. S. Stanard	Woodworth.
South Bristol Cheese Factory	Bristol.
J. M. Kellogg's Factory	Woodworth.
J. M. Wilbur	Wilmot.
O. C. Stonebreaker	Bristol.
J. V. Vosburgh	Richmond, Ill.
Maynard & Stevens	Salem.
George H. Booth	Salem.
J. M. Kellogg	Woodworth.
Henry G. Blackman	Kenosha.
C. C. Holt	Kenosha.
Simmons & Co	Koeosha.
W. C. White	Kenosha.
M. B. Hubburd	Pleasant Prairie.
Eureka Creamery	Salem.
C. Williams	Bristol.
O. C. Stonebreaker	Bristol.
LA CROSSE.	
L. R. Bowen	Bangor.
LA FAYETTE.	
Darlington Cheese Co	Darlington.

COUNTIES AND NAME OF FACTORY OR PROPRIETOR.	P. O. ADDRESS.
MANITOWOC	
Lilloffe & Ecke	Kiel.
A. Ecke	Meemee.
Daniel Kuentz	Newtonberry.
Pierce Bros	Hika.
Nelson Darling	Cato.
MILWAUKEE	
Wauwatosa Cheese Co	Wauwatosa.
F. A. Yankee	Northern Junction.
A. Thomas & Son	Good Hope.
MONROE.	
Cataract Factory	Cataract.
N. W. Creamery	Tomah.
Charles E. Bell	Tomah.
Sparta Factory	Sparta.
Leon Valley	Leon.
Hunt's Mills	Medina.
OUTAGAMIE.	
Louis Perrott	Granville.
E. M. Gowell	Granville.
H. Brockway	Appleton.
H. M. Armstrong	Fredonia.
Edward Nye	Fredonia.

OZAUKEE.	
Ingersol & Eckle	Port Washington.
Butter made in the county	
RICHLAND.	
G. J. Carswell & Son	Lone Rock.
H. L. Eaton	Lone Rock.
A. Shaunce	Bear Valley.
Geo. Turner	Sextonville.
A. & D. Beckwith	Lone Rock.
Barker's Factory	Bear Valley.
ROCK.	
Bent, Cheever & Pierce	Clinton.
B. S. Hoxie	Cooksville.
Wm. Zimmerman	Edgerton.
James Clough	Edgerton.
E. Devereux	Evansville.
Clover Dale Factory	Lima Center.
Godfrey's Factory	Lima Center.
SHEBOYGAN.	
J. A. Smith	Sheboygan.
H. Habighurst	Sheboygan.
G. W. Weeden	Sheboygan.
F. Widder	Sheboygan.
J. Sieber	Sheboygan.
W. Springborn	Sheboygan.
J. G. Peacock	Sheboygan Falls.
A. & A. B. Dye	Sheboygan Falls.
D. Kuentz	Sheboygan Falls.
Mrs. C. Strong	Sheboygan Falls.

SHEBOYGAN — continued.	
S. H. Conover	Plymouth.
S. A. Richmier	Plymouth.
H. Graef	Plymouth.
Gilman Factory	Plymouth.
A. Kuentz	Howard's Grove.
W. Siemers	Howard's Grove.
J. Ochs	Howard's Grove.
C. Grœne	Johnsonville.
J. Kæstner	Johnsonville.
Wm. Hutman	Sheboygan.
Karl Reich	Sheboygan.
Wm. Koch (3 factories)	Plymouth.
Pierce Bros	Sheboygan Falls.
John Kalsteiner	Johnsonville.
G. W. Bradley	Scott.
Slyfield & Thompson	Hingham.
Hiram Conover	Plymouth.
Hiram Smith	Sheboygan Falls.
E. Montgomery	Greenbush.
H. Eiche	Mosel.
G. W. Bradley	Scott.
Harmon's Factory	Winooski.
M. Lemmin	Edwards.
R. M. Johnson	Rathbun.
W. Crosby & Co	Cascade.
W. Berkle	Howard's Grove.
M. Maher	Sheboygan Falls.
John Dessau	Sheboygan Falls.
C. Altrop	Mosel.
Wilson J. Stock	Sheboygan.
Wilson Six Corners	Sheboygan.
C. Rockwell	Hingham.
H. Feldman	Elkhart.
J. Negler	Russell.

LIST OF CHEESE FACTORIES AND CREAMERIES—continued.

COUNTIES AND NAME OF FACTORY OR PROPRIETOR.	P. O. ADDRESS.
SHEBOYGAN—continued.	
A. D. De Land	Sheboygan Falls.
Wm. Stronko	Cedar Grove.
Robt. A. Swann	Cascade.
Holden Bros	Sheboygan Falls.
J. Littlefield	Plymouth.
J. Misselink	Gibbsville.
S. Reiniking	Gibbsville.
Mather Bros	Sheboygan Falls.
Jas. Slyfilla	Hingham.
C. F. F. Karstaedt	Mosel.
A. Dye	Waldo.
S. A. Rickmeier	Plymouth.
F. A. Streblow	Johnsonville.
A. D. Hanson	Sheboygan Falls.
L. Hills	Glenbeulah.
J. A. Smith	Glenbeulah.
H. J. Bumford	Plymouth.
F. C. Joems	Winooski.
M. L. Yoemans	Scott.
SAUK.	
Tuckerville Cheese Co	Logansville.
VERNON.	
Wm. F. Sato	Hillsborough.
WAUKESHA.	
Olin & Clinton	Waukesha.
T. C. Dousman	Waterville.
B. R. Hinckley	Oconomowoc.
Monterey Factory	Monterey.
Frank Shultis	Waukesha.
Thomas Steele	Genesee.
Richard Milton	Eagle.
Frank Shultis	Mukwonago.
Waterville Factory	Waterville.
Rose Glen Creamery	Waukesha.
Dell Ostrander	Monterey.
M. Rowell	Hartland.
Wauwatosa Cheese Co	Elm Grove.
WAUSHARA.	
A. H. Wheaton	Auroraville.
R. P. Colt	Poysippi.
WAUPACA.	
Weyauwega Cheese Factory	Weyauwega.
S. A. Oakes	Ogdensburg.
Charles Gibson	Lind.
Wm. Hamilton	Clintonville.
Thomas W. Rhodes	Weyauwega.
Craig & McCord	Royalton.
New London Factory	New London.

WALWORTH.	
Pearson Brothers	Sharon.
S. G. Nichols	Geneva.
S. Lytle, Oak Ridge Creamery	Elkhorn.
D. L. Flack	Elkhorn.
J. G. Flack	Elkhorn.
J. A. Chase	Elkhorn.
Chase, Burner & Caswell	Elkhorn.
C. R. Beach	Whitewater.
H. A. Conger	Whitewater.
R. Springsteen	Whitewater.
R. S. Benson	Geneva Junction.
Cheever & Pierce	Delavan.
C. B. McCanna	Springfield.
C. B. McCanna	Spring Prairie.
C. B. McCanna	Rochester.
H. & J. D. Godfrey	Whitewater.
Westville Cheese Co	Elkhorn.
WASHINGTON.	
Jacob Hamm	Kohlsville.

WINNEBAGO.	
John Ryfe	Oshkosh.
Christ. Perrin	Oshkosh.
Crist. Boss	Oshkosh.
C. Bellinger	Oshkosh.
Mr. Kettle	Oshkosh.
George Rogers	Oshkosh.
Charles Vedder	Eureka.
F. Stune	Waukau.
D. Grossman	Omro.
S. S. Walter	Eureka.
Bishop's Cheese Factory	Omro.
J. G. Picket	Picket's Station.
F. W. Wheeler	Neenah.
Henry Searl's Factory	Picket's Station.
Emery Davis' Factory	Picket's Station.
Peas' Factory	...

JEFFERSON COUNTY DAIRY BOARD OF TRADE.

Meet at Jefferson, Wis.

OFFICERS:

President — Edward McMahon, Jefferson.
Vice President — George C. Mansfield, Johnson's Creek.
Treasurer — Yale Henry, Jefferson.
Secretary — W. D. Hoard, Fort Atkinson.

Jefferson county is situated fifty miles west of Milwaukee, and one hundred and eleven miles north of Chicago. On the north and south borders pass two of the principal lines of the Chicago, Milwaukee & St. Paul R. R., the La Crosse and the Prairie du Chien divisions. The Wisconsin division of the Chicago & Northwestern R. R. passes through the county in a north and south direction, on which are the important shipping points of Fort Atkinson, Jefferson, Johnson's Creek and Watertown.

The product of cheese in 1879, as near as can be estimated, was 3,500,000 pounds. Of butter, about 1,500,000 pounds. Jefferson county produces about one-tenth of the entire cheese product of the state.

The meetings of the board occur on Tuesday of each week.

W. D. HOARD, *Secretary.*

THE SOUTHERN WISCONSIN BOARD OF TRADE.

Located at Elkhorn.

President — D. L. Flack.
Vice President — S. Favill.
Treasurer — W. D. Lyon.
Secretary — W. H. Morrison.
Directors — S. Favill, Delavan; Asa Foster, Sugar Creek; C. B. McCanna, Springfield; R. Pierson, Sharon; A. Potter, La Fayette.
Committee of Arbitration — C. R. Beach, Whitewater; D. G. Cheever, Clinton; R. J. Hance, Geneva; John Matheson, Troy; M. Ranney, La Fayette.
Committee of Appeals — William Hollinshead, Delavan; Virgil Cobb, La Fayette; Mr. McCutchen, Whitewater.
Sale day, every other Wednesday.

SHEBOYGAN COUNTY DAIRY BOARD OF TRADE.

President — Hon. Geo. W. Weeden, Sheboygan.

Secretary and Treasurer — W. C. Thomas, Sheboygan Falls.

Executive Committee — Hon. Hiram Smith, Sheboygan Falls; H. J. Bumford, Plymouth; I. N. Strong, Sheboygan Falls.

Sale day, every Friday afternoon.

Sheboygan county has eighty-three cheese factories. Nearly the whole cheese product of the county is sold at the dairy board of trade.