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EIGHTH ANNUAL REPORT

OF THE

AMERICAN

DAIRYMEN'S ASSOCIATION,

WITH TRANSACTIONS AND ADDRESSES AT ANNUAL MEETING—LIST OF
CHEESE FACTORIES—LIST OF MEMBERS—REPORTS OF FACTORIES,
AND OTHER PAPERS OF VALUE AND INTEREST.

FOR THE YEAR 1872.

PUBLISHED BY THE ASSOCIATION.

ROCHESTER, N. Y.:

DEMOCRAT & CHRONICLE BOOK AND JOB PRINTING HOUSE.

1872.

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OFFICERS OF THE ASSOCIATION, FOR 1873.

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PRESIDENT:

HON. HORATIO SEYMOUR, OF ONEIDA.

VICE-PRESIDENTS:

HON. T. G. ALVORD, OF ONONDAGA, NEW YORK.
N. A. WILLARD, OF HERKIMER.
T. D. CURTIS, OF ONEIDA, NEW YORK.
O. S. BLISS, OF VERMONT.
ASAHEL BURNHAM, OF CHAUTAUQUA, NEW YORK.
DAVID W. LEWIS, OF NEW YORK CITY.
C. E. CHADWICK, OF CANADA.
ALEX. McADAM, OF MONTGOMERY, NEW YORK.
S. FAVILLE, OF WISCONSIN.
G. B. WEEKS, OF ONONDAGA, NEW YORK.
WM. BLANDING, OF BROOME, NEW YORK.
S. R. TOWNSEND, OF FRANKLIN, NEW YORK.
DAVID HAMLIN, OF JEFFERSON, NEW YORK.
GEN. B. F. BRUCE, OF MADISON, NEW YORK.
L. R. SMITH, OF ERIE, NEW YORK.
H. FARRINGTON, OF CANADA.
J. LEWIS, OF CATTARAUGUS.
E. N. SOUTHWORTH, OF ST. LAWRENCE, NEW YORK.
E. S. MUNSON, OF DELAWARE, NEW YORK.
J. M. WALDEN, OF MINNESOTA.
DR. L. L. WIGHT, OF ONEIDA, NEW YORK.
W. A. JOHNSON, OF ERIE, NEW YORK.
S. STRAIGHT, OF OHIO.
A. B. LAMOUNT, OF TOMPKINS, NEW YORK.
CHESTER HAZEN, OF WISCONSIN.

SECRETARY:

L. B. ABNOLD, ROCHESTER, N. Y.

TREASURER:

HON. HARRIS LEWIS, FRANKFORT, HERKIMER Co., N. Y.

PREFATORY REMARKS.

The report herewith submitted, though not as large as some of its predecessors, will be found well worth its cost.

It was the policy of the Board of Officers in preparing for the Convention, to replace the more lengthy addresses of paid speakers, with short voluntary addresses by members, and to occupy more time with discussions. This somewhat shortened the matter for reporting, but it contributed to the animation and spirit of the sessions.

The debates were lively and were conducted with more than the usual interest.

The addresses reached about the usual number and were well sustained in point of merit, being, without exception, sound and well prepared papers, and will be read with interest and profit.

The sociable at Bagg's Hotel on the second evening of the session was fully patronized by the Convention, and was enjoyed by all with a most hearty good feeling. To the public spirit and generosity of the parties providing this entertainment are the members of the Convention, much indebted for the growth of the social features of the association. The sessions of the Convention, always courteous and friendly, were unusually pleasant and cheerful, and seemed more like a meeting of old friends than an assemblage for formal discussions.

More attention was given to butter-making than at previous meetings, which it was gratifying to see, as that branch of dairy husbandry is somewhat in the rear.

The propriety of making butter and cheese from the same milk elicited a leading interest in the discussions, of which it is to be regretted a more complete report cannot be made, as they constitute a very important part of the labors of the Convention. But it is difficult, if not impossible, to report them in full. They are frequently carried on in an informal way, and are not confined to the regular

sessions, but are often continued outside of and between them. In fact, a great deal of discussion occurs at the hotels and in social knots, and much important and useful information changes hands in this way that no reporter can reach. There is no other way to reap the full benefit of these annual gatherings but to be present and mingle with the proceedings.

The Secretary is under obligations to the *Daily Utica Herald* and the former Secretary, for the aid they have afforded in making up this report.

L. B. ARNOLD,
Secretary.

Rochester, N. Y., April, 1872.

THE FOLLOWING IS THE LAW IN THE STATE OF NEW YORK.

BEARING UPON THE SUBJECT OF

BUTTER AND CHEESE FACTORIES.

Whoever shall knowingly sell, supply or bring to be manufactured to any butter or cheese manufactory in this State, any milk diluted with water, or from which any cream has been taken, or milk commonly known as skimmed milk, or whoever shall keep back any part of the milk known as “strippings,” or whoever shall knowingly bring or supply milk to any butter or cheese manufactory that is tainted or partly sour from want of proper care in keeping pails, strainers, or any vessels in which said milk is kept, clean and sweet, after being notified of such taint or carelessness; or any butter or cheese manufacturer who shall knowingly use or allow any of his employees, or any other person, to use for his or for their own individual benefit any milk or cream from the milk brought to said butter or cheese manufacturer, without the consent of all the owners thereof, or any butter or cheese manufacturer who shall refuse or neglect to keep or cause to be kept a correct account (open to the inspection of any one furnishing milk to such manufacturer) of the amount of milk daily received, or of the number of pounds of butter and the number and aggregate weight of cheeses made each day, or of the number cut or otherwise disposed of, and the weight of each, shall, for each and every offence, 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 corporation, or their assigns, upon whom such fraud or neglect shall be committed.

ARTICLES OF ASSOCIATION.

WHEREAS, It is deemed expedient to merge the New York State Cheese Manufacturers' Association, which was organized in January, 1864, into an American Association, through which, as a medium, results of the practical experience of dairymen may be gathered and disseminated to the dairying community; therefore,

Resolved, That we, the undersigned, do hereby associate ourselves together for mutual improvement in the science of cheese-making, and more efficient action in promoting the general interest of the dairy community.

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

ART. II. The officers of the Association shall consist of a President, Vice-Presidents, Secretary and Treasurer.


ART. III. The President, Vice-Presidents, Secretary and Treasurer, shall constitute the Executive Board of the Association.

ART. IV. The Officers of the Association shall be elected at the regular annual meeting, and shall retain their offices until their successors are chosen.

ART. V. The regular annual meeting shall occur on the second Tuesday in January of each year, and at such place as the Executive Board shall designate.

ART. IV. The payment of one dollar shall admit any person to all the sessions of an Annual Meeting—and the additional payment of seventy-five cents shall entitle him to the Annual Report for the current year.

[One dollar constitutes a person not attending an Annual Convention a member of the society for one year, and entitles him to the Annual Report.]

 The next Annual meeting will begin at Utica, N. Y., on Tuesday, January 13th, 1874.

LIST OF MEMBERS

OF THE

AMERICAN DAIRYMEN'S ASSOCIATION.

FOR THE YEAR 1873.

- Arnold, L. B., Rochester, N. Y.
Ayer, E. A., Watertown, Jefferson co., N. Y.
Ashley, L. H., Corfu, Greene co., N. Y.
Alvord, Thomas G., Syracuse, N. Y.
Ashfield, Wm. H., 22 West Fayette street, Syracuse, N. Y.
- Blanchard, P. & S., Concord, N. H.
Brown, R. D., Estonville, Herkimer co., N. Y.
Blair, Wm., Truro, C. W.
Breckenbridge, Thomas, Jr., Fonda, Montgomery co., N. Y.
Bussey, A. P., Westerville, Oneida co., N. Y.
Barker, J. W., Syracuse, N. Y.
Brayton, A. A., Poland, Herkimer co., N. Y.
Burnham Asabel, Sinclairville, Chautauque co., N. Y.
Babcock, C. G., Newport, Herkimer co., N. Y.
Baker, Abel, Angelica, Allegany co., N. Y.
Braun, W. L., Unadilla Forks, Otsego co., N. Y.
Briggs, L. M. No. Pitcher, Chenango co., N. Y.
Barber, B. L., Scott, Cortland co., N. Y.
Brown, S. R., Newport, Herkimer co., N. Y.
Brown, L. M., Sargent's Bluff, Woodbury co., Iowa.
Bliss, H. M., Mohawk, Herkimer co., N. Y.
Bliss, O. S., Georgia, It.
Burrell, D. H., Little Falls, Herkimer co., N. Y.
Blanding, F., Brookfield, Madison co., N. Y.
Blanding, William, Hawleyton, Broome co., N. Y.
Blodget, O. C., Fredonia, Chautauque co., N. Y.
Bates, Miss Eliza, Whitesboro, Oneida co., N. Y.
Bradley, E. F., Delta, Oneida co., N. Y.
Buckingham, J. D., Rochester, N. Y.
Bruce, B. F., Canastota, Madison co., N. Y.
Burr, John, Redfield, Oswego co., N. Y.
- Cotes, John G., Holland Patent, Oneida co., N. Y.
Cole, Charles L., Pine Run, Genesee co., Mich.
Clark, F., Verona, Oneida co., N. Y.
Colton, Prof. Henry E., Times Office, New York City.
Carr, I. J., Rural Grove, Montgomery co., N. Y.
Campbell, McK., Fonda, Montgomery co., N. Y.
Comfort, M. H., Richburg, Allegany co., N. Y.
Chadwick, C. E., Ingersol, C. W.
Case, Titus, Owatonna, Minn.
Cook, Wm., Hesper, Iowa.
Curtis, T. D., Utica, Oneida co., N. Y.
- Davison E. A., Cadis, Cattaraugus co., N. Y.
Davison, John W., Frankfort, Herkimer co., N. Y.
Deitrich, H. V., Lowell, Oneida co., N. Y.
Davis, Geo. W., Little Falls, Herkimer co., N. Y.
- Ellis, E. G., Utica, Oneida co., N. Y.
Eldred, N., Iowa Falls, Iowa.
Emerson, Edward, Springville, Erie co., N. Y.
Eastman, W. H., Bellville, Jefferson co., N. Y.
Ellison, Jacob, Middleville, Herkimer co., N. Y.
Fobes, O. P., Lindenville, Ashtabula co., O.
Farrington, S. A., Franklinville, Cattaraugus co., N. Y.
Farrington, H., Norwich, Ontario, Canada.
Faville, Mark, Brocket's Bridge, Herkimer co., N. Y.
Franklin, F., Brier Hill, St. Lawrence co., N. Y.
Francis, Gilbert, McLean, Tompkins co., N. Y.
Felton, Merit B., Delta, Oneida co., N. Y.
Fitch, N. H., Verona, Oneida co., N. Y.
Folsom M., 165 Chambers street, New York.
Fenner, Wm. B., Herkimer, Herkimer co., N. Y.
Foster, E. B., Stockbridge, Madison co., N. Y.
Fay, J. C., 73 Walnut street, Cincinnati, O.
Finehout, Geo. H., Eatonville, Herkimer co., N. Y.
- Greene, H. Cooley, Woodcockboro, Crawford co., Pa.
Grosling, H. D., Miller's Mills, Herkimer co., N. Y.
Gates, Wm. M., Whitesboro, Oneida co., N. Y.
Graham, William, Rochester, N. Y.
Gilbert, Harris, Sidney Plains, Delaware Co., N. Y.
Golden, R., Little Falls, Herkimer co., N. Y.
Hills, Edgar, Vernon, Oneida co., N. Y.
House, Charles C., Houseville, Lewis co., N. Y.
Howard, L. A., Deerfield, Oneida Co., N. Y.
Hazen, Chester, Ladoga, Fond du Lac co., Wis.
Hodkin, J. F., Gouverneur, St. Lawrence co., N. Y.
Horton, J. V., Boston, Erie co., N. Y.
Hart, Elon, West Williamsfield, Ashtabula co., O.
Hawley, L. T., Salina, Onondaga co., N. Y.
Hopson, E. R., Brocket's Bridge, Herkimer co., N. Y.
Harrison, T. L., Albany, Albany co., N. Y.
Holloway, J. H., Winchester, Ky.
Harris, Joseph, Rochester, N. Y.
Hayward, Geo. W., Buffalo, N. Y.
- Ives, James, Salisbury, Herkimer co., N. Y.
Ives, Fred., Salisbury, Herkimer Co., N. Y.
Ingraham A. W., Adams, Jefferson co., N. Y.
Johnson, Wm. A., Collins Centre, Erie co., N. Y.
Jaynes, Geo. W., North Norwich, Chenango co., N. Y.
Jones, Charles M., Cassville, Oneida co., N. Y.
Jones, Faulkner & Co., Utica, N. Y.

- Knapp, Edgar, Starkville, Dutchess co., N. Y.
 Lamphear, J. E., Newport, Herkimer co., N. Y.
 Lewis, J. B., Newport, Cattaraugus co., N. Y.
 Lewis, Harris, Frankfort, Herkimer co., N. Y.
 Lord, W. H., Mount Holly, Rutland co., Vt.
 Lincoln, S. L., South Adams, Mass.
 Lewis, A. W., Medina, Medina co., O.
 Lawton, C. F., Flushing, Genesee co., Mich.
 Losee, H. S., Norwich, Oxford co., Canada.
 Lamont, A. B., McLean, Tompkins co., N. Y.
 Merry, G., Verona, Oneida co., N. Y.
 McHenry, Walter, Almond, Allegany co., N. Y.
 Miller, S. T., Constableville, Lewis co., N. Y.
 Merrill, H. S., Farmersville, Cattaraugus co., N. Y.
 McCubbin, Robert, Perrysburgh, Cattaraugus co., N. Y.
 McAdams, R., Lee Centre, Oneida co., N. Y.
 Merrill, R. F., Norwich, Chenango co., N. Y.
 Munson, E. S., Franklin, Delaware co., N. Y.
 Marshall, James A., Chittenango, Madison co., N. Y.
 Munger, Milo, Shirland, Winnebago co., Ill.
 Moon, B. B., Norway, Herkimer co., N. Y.
 McAdam, Alex., Fort Plain, Montgomery co., N. Y.
 Morris, T. E., South Williamstown, Berkshire co., Mass.
 Mores, G. B., Red Falls, Greene co., N. Y.
 McCall, James L., Rupert, Bennington co., Vt.
 Morris, H. N., Tiskilwa, Bureau co., Ill.
 Malum, Andrew, Rodgerville, C. W.
 McPherson, David M., Lancaster, River Raisin, C. W.
 Meags, J. H., Vienna, Oneida co., N. Y.
 Nichols, D. A. A., Westfield, Chautauque co., N. Y.
 Nash, Wm., Crossingville, Crawford co., Pa.
 Owens, Samuel J., Sandusky, Cattaraugus co., N. Y.
 Oyer, D., Schuyler, Herkimer co., N. Y.
 Perkins, J. T., Broman Corners, Schenectady co., N. Y.
 Prescott, Thomas, Walesville, Oneida co., N. Y.
 Phillips, C. C., Vernon, Oneida co., N. Y.
 Palmer, W. R., Wattsburg, Erie co., Pa.
 Pierce, S. D., Belmont, Wright co., Iowa.
 Parsons, Geo. A., Stockton, Minn.
 Parker, Ira J., Warsaw, Wyoming co., N. Y.
 Robbins, Lucius S., Box 6, 190, New York.
 Richardson, C. W., Herkimer, Herkimer co., N. Y.
 Ransom, P. A., Hempstead, Queens co., N. Y.
 Renan, J. J., Onondaga Valley, Onondaga co., N. Y.
 Simpson, Wm., Jr., West Farms, Westchester co., N. Y.
 Smith, James A., Constableville, Lewis co., N. Y.
 Stowell, C., Georgetown, Madison co., N. Y.
 Stowell, P. R., Erieville, Madison co., N. Y.
 Snow, Jacob D., Rural Grove, Montgomery co., N. Y.
 Seymour, Hon. Horatio, Utica, N. Y.
 Schermerhorn, J. M., North Gage, Oneida co., N. Y.
 Smith, P. H., Brocket's Bridge, Herkimer co., N. Y.
 Steene, R., Toddsville, Otsego co., N. Y.
 Stillman, D. B., Brookfield, Madison co., N. Y.
 Schutz, Theodore, Cedarville, Herkimer co., N. Y.
 Smith, C. W., Glover, Herkimer co., N. Y.
 Scoville, J. V. H., Paris, Oneida co., N. Y.
 Sheldon, C. L., Lowville, Lewis co., N. Y.
 Smith, S. R., Springville, Erie co., N. Y.
 Scripture, S. H., 34 Liberty street, New York.
 Schermerhorn, L. C., North Gage, Oneida co., N. Y.
 Staples, E., Danbury Four Corners, Rutland co., Vt.
 Stanborough, Jas. D., Brookfield, Tioga co., Pa.
 Simmons, L. N., Farmington, Oakland co., Mich.
 Smith, Hiram, Sheboygan Falls, Sheboygan co., Wis.
 Smith, F. C., Rochester, Olmstead co., Minn.
 Sheldon, John P., Sherbourne, Derbyshire, England.
 Stradling, Thos., Hamilton, Madison co., N. Y.
 Timmerman, G. C., Orleans Four Corners, Jefferson co., N. Y.
 Turner, Frankiin L., Lyon's Falls, Lewis co., N. Y.
 Thompson, H. N., Auburn, N. Y.
 Wilders, Davis, Farmington, Oakland co., Mich.
 Waldrow, Robert, Rochester, Olmstead co., Minn.
 Wing, L. J., Unadilla Forks, Otsego co., N. Y.
 Weller, P. S., Boonville, Oneida co., N. Y.
 White, A. & Co., Sherburne, Chenango co., N. Y.
 Winslow, E. R., Hallsville, Montgomery co., N. Y.
 Wheeler Wm, H., Trenton Falls, Oneida co., N. Y.
 West, F. L., Farmington, Oakland co., Mich.
 White, Mrs. A. M., Canton, St. Lawrence co., N. Y.
 Wardsworth, Theodore, Box 400, Rome, Oneida co., N. Y.
 Willis, Geo. H., Newport, Herkimer co., N. Y.
 Willard, X. A., Little Falls, Herkimer co., N. Y.
 Wight, L. L., Whitesboro, Oneida Co., N. Y.
 Weeks, Gardner B., Syracuse, N. Y.
 Wilder, C. H., Evansville, Wis.
 Wade, Henry, Port Hope, C. W.
 Wheaton, Allen, West Paulet, Rutland co., Vt.
 Wheaton, Allen, West Paulet, Vt.
 Young, D. G., Cedarville, Herkimer co., N. Y.

LIST OF CHEESE AND BUTTER FACTORIES.

New York.
ONEIDA COUNTY.

		No. of Cows.			No. of Cows.
Rome C. M. A.	Rome,	650	N. W. C. M. A. Factory,	N. Western,	
Excelsior Factory,	do	600	Crill's	do	
Greenfield's	do		Bronson's	do	
Cady's	do	300	Verona Landing,	Higginsville,	400
D. D. Carpenter's	do	600	Doxtater's	do	250
Dick's	do		L. S. Davis'	Florence,	500
Squires	do		Cold Spring	do	400
Ridge Mills,	Delta,	300	Mad River,	do	250
T. D. Roberts'	Ridge Mills,	300	Vernon	Vernon,	720
E. Lewis'	do		Vernon & Verona	do	
Tanner's	Deerfield,	900	Clark's	do	500
Mitchell's	Oriskany,	700	M. Snell's	do	300
Thomas'	Remsen,	200	Bronson & Co.	Vernon Centre,	300
Star Hill	do	400	W. Canada Creek	North Gate,	500
Weeks'	do	100	A. Blue's	do	150
Fitch's	Verona,	800	J. C. Blue's	do	700
Burrell's	do	400	Brigg's	Marcy Hill,	
Verona Central	do	300	Wood's	Turin,	
Willow Grove,	do		Shepard's	do	
W. W. Wheeler's	Trenton,	1000	Franklin	F. Iron Works,	500
J. C. Owens'	do	350	Camp's Factory	Westmoreland,	400
Powell's	do	550	Cheney's	do	250
Whitaker's	do	250	Hampton C. M. A.	do	500
Wight's	Whitesboro.	900	Marshall's	Waterville,	700
Bagg's,	Stittville,	700	Curtis'	do	250
Deerfield & Marcy	Utica,	400	Shearman's	New Hartford,	500
South Corners,	do	400	Hampton	Stanwix,	500
Vienna	Vienna,	350	Schuyler's	do	360
West Vienna	West Vienna,		Foster's	Durhamville,	425
Blossvale	Blossvale,	406	J. H. Brook's	Steuben,	590
Glenmore	Annsville,	500	Chuckery	Paris,	450
Bagg's	Holland Patent,	500	Wilcox	do	
J. G. Cotes'	do	400	A. S. King	Sanquoit,	
J. F. Pierce's	do	550	A. Sessions	do	
G. W. Palmer's	N. Bridgewater,	600	A. Tucker's	do	250
Deansville	Deansville,	700	S. Thomas'	Cassville,	300
Hills	Westernville,	200	E. A. Palmer's	Clayville,	200
Williams'	do	200	Union Grove,	Camden,	150
Waldo's	do	350	Harvey's	Boonville,	
Kirkland	Kirkland,	200	Reed & Co.	do	500
Wallace's	W. Branch,	400	Knoxboro	Knoxboro,	400
Countryman's	do		Rathbun's	New London,	400
J. L. Dean's	Hecla,	200	N. London C. M. A.	do	300
Lowell	Lowell,	600	Ray's	North Bay,	
Wood's	Lee Centre,	560	Spinning's	Taberg,	
Saxton's	do	300	G. M. Wood's	Stokes,	
Charton's	do	400	Hurlburt's	Ava,	
Capron's	do		Jones'	do	

CHENANGO COUNTY.

Tuttle Factory,	Columbus,	230	L. Andrews Factory,	South Otselic,	
Hiram Brown's	do	400	Holmesville	Holmesville,	650
A. R. Sage's	N. Berlin Centre,	800	Daniel's	McDonough,	600
Holmes & Co.'s	Columbus,	600	Lincklaen	Lincklaen,	500
George Bucl's	King Settlement,	600	Wheeler's	do	
Sherburne	Sherburne,	700	Harrington	do	
Smyrna	Smyrna,		Norwich C. M. Co.	Norwich,	500
Billings'	do		Frink's	do	
Plymouth	Plymouth,		Leach's	do	
Buckleys & Co.s	Oxford,		Sage's	S. New Berlin,	
Harrisville	Sherburne,	350	Rich's	do	
White & Son's	do		Brown, Sage & Co.,	do	860

CORTLAND COUNTY.

Cuyler Village Factory,	Cuyler,	600	Raymond's Factory,	Preble,	600
Cold Spring	do	300	Kitt's	do	425
Isbell's	do	250	Homer C. M. Co.	Homer,	600
Keeler's	do	200	Tuttle's	Freetown,	400
Cuyler Hill	do	450	Cincinnati's	Cincinnati's,	400
New Boston	do	200	S. Cortland	S. Cortland	
L. Sears'	DeRuyter,	650	Meecham's	Marathon,	300
Kenny	Truxton,	1,000	Brown's	Taylor,	400
Beattie's	do	400	Keeney Settlement	K. S.,	700
East Homer	East Homer,	400	Whitmarsh	do	
Wightman's	Marathon,	450	H. H. Smith's	Apulia,	
Potter & Barber's	Scott,	300	Harford	Harford,	
Blodgett Mills,	Blodgett's Mills,	150			

MADISON COUNTY.

Norton's	Factory,	Eaton,		Chapman's	Factory,	Oneida Lake,	300
Morse's	do	do	600	Hart's	do	do	250
W. Eaton	do	W. Eaton,	500	Morrell's	do	do	150
Pecksport	do	Bouckville,	450	Cole's	do	Munnsville,	350
Erieville	do	Erieville,	700	Lincklaen	do	DeRuyter,	300
Seymour's	do	Lebanon,	400	DeRuyter	do	do	600
Smith Valley	do	do	600	Fletcher's	do	Peterboro,	750
Hill's	do	Oneida Castle,	700	Valley	do	Stockbridge,	450
Cazenovia	do	Cazenovia,	600	Adams	do	do	
C. Bridge	do	do		N. Woodstock	do	New Woodstock,	800
Blodgett's	do	do	200	Hunt's	do	Hubbardsville,	200
Perkin's	do	do		Lamunjon & Co.	do	Morrisville,	400
Clockville	do	Clockville,	500	Morrisville,	do	do	600
N. Cazenovia	do	Chittenango,	300	Gaige & Son	do	Nelson,	600
Chittenango	do	do		Ellison's	do	Brookfield,	200
Lebanon	do	Leonardsville,	500	Excelsior	do	do	350
Allard's	do	Georgetown,	150	York	do	do	225
Quaker Basin	do	do	300	Union	do	do	200
Torpy's	do	do	150	S. Brookfield	do	South Brookfield,	250
Mack's	do	do	160	Bridgeport	do	Bridgeport,	300
Brown & Co.'s	do	do	500	Lakewood	do	do	273
Beech & Co.'s	do	do	175	Fort Bushnell's	do	Lakeport,	400
Fletcher's	do	do	200	Gifford's	do	do	
Stafford's	do	Fenner,	200	Tucker's	do	Mill Strip,	300
Solsville	do	Solsville,	700	Lennox C. M. A.	do	Canastota,	500
Pine Woods	do	Pine Woods,	600	Merrill's	do	Madison,	
Baker's	do	Earlville,	300	Madison C. M. A.	do	do	
Chenango Valley	do	do		Siloam	do	Siloam,	400
Cowasalon	do	Wampsville,	500	Pratt's Hollow	do	Pratt's Hollow,	250
Walrath's	do	do		Shedd's Corners	do	Shedd's Corners,	250
Hunt's	do	Hamilton,		Downing's	do	Pine Woods,	
Keith's	do	North Brookfield,		Decker's	do	Oneida Valley.	
East Boston	do	East Boston,					

JEFFERSON COUNTY.

Adams,	Adams,	Heath's,	Adams Centre,
Alexander's,	Henderson,	Hamlin,	Rutland,
Antwerp,	Antwerp,	Harper's Ferry,	Rutland Centre,
Ayers,	Watertown,	Henderson,	Henderson,
Babcock's,	Champion,	Howard,	Stone Mills,
Barber's,	Philadelphia,	Lorraine Central,	Lorraine,
Bonfoy & Bettinger,	Mannsville,	Limerick,	Dexter,
Belleville,	Belleville,	Leflingwell,	Henderson,
Bent,	Antwerp,	Mannsville,	Mannsville,
B. P. Smith,	Black River,	Maple Grove,	Lorraine,
Brownville,	Brownville,	Muscallowge,	Dexter,
Brown,	Watertown,	Muzy's,	Smithville,
Benjamin & Co.'s,	Camp's Mills,	Pillar Point,	Dexter,
Carter Street,	Stone Mills,	Philadelphia,	Philadelphia,
Cascade,	Rutland,	Pitkins,	Lorraine,
Champion Village,	Champion,	Rodman,	Rodman,
Cooper's,	Evan's Mills,	" Branch,	Burrville,
Cold Spring,	Watertown,	Rogers,	Ellisburgh,
Cold Spring,	Belleville,	Rogers,	Lorraine,
Cold Spring,	Robert's Corners,	Rutland Valley,	Watertown,
Campbell's,	South Rutland,	Sherman's,	Watertown,
Dry Hill,	Watertown,	Springer's,	Redwood,
Davis'	Smithville,	Smithville,	Smithville,
Eames'	Rutland,	South Champion,	South Champion,
East Rodman,	East Rodman,	Springside,	Dexter,
Earl,	Carthage,	Sterlingbush,	Antwerp,
Ellisville,	Ellisburgh,	Tifts,	Lorraine,
Evans Mills,	Evan's Mills,	Timmerman's,	Orleans 4 Corners,
Excelsior,	Perch River,	Warner,	Adams Centre,
Farr,	South Champion,	Wescott,	Watertown,
Foreman's,	Pierrepont Manor,	Whitesville,	East Rodman,
Griswold & Reed,	Woodville,	Wicks,	Antwerp,
Gardner's,	Lorraine,	Wilson,	Watertown,
Grinnell & Co.	Watertown,	Wright,	Depauville,
Hadsall's	Pierrepont Manor,	Woodville,	Woodville,
	Felts Mills,	Worth,	Worthville,
			500

ST. LAWRENCE COUNTY.

Olin & Smead's Factory,	Canton,	675	Beech Grove	Factory,	Russell,	500
Southville	do	200	W. Canton	do	Canton,	
Richville,	do	640	South Canton,	do	Crary's Mills,	450
Jones'	do		DeKalb	do	DeKalb,	700
Potsdam,	do	500	Gouverneur	do	Gouverneur,	500
Hailsboro,	do	600	Pike's	do	Shingle Creek,	
Sprague Corners,	do	600	W. Fowler	do	do	
Russell Village,	do	500	Hermon	do	Hermon,	

HERKIMER COUNTY.

Herk. Co. Un'n Factory,	Little Falls,	700	Skinner's	Factory,	So. Columbia,
Manheim Centre do	do	600	Kling's	do	Paine's Hollow,
Manheim Turn. do	do	500	Middleville,	do	Middleville,
Manheim do	do	650	Northrup's	do	Litchfield,
Snell's Bush do	do	550	Kinney's	do	do
Newville C. M. A. do	do	860	Walraih's	do	N. Litchfield,
Rice, Broat & Co.'s do	do	900	Van Hornsville,	do	Van Hornsville,
G. W. Davis' do	do	600	Young's	do	do
Cold Spring do	do		Lackey's	do	W. Winfield,
Top Notch do	do	450	H. C. Brown's	do	do
Van Allen's do	do		Wadsworth's	do	do
Fairfield Associa'n do	Fairfield,	1000	W. Palmer's	do	do
No. Fairfield do	do	600	Edick's	do	Mohawk,
Old Fairfield do	do	900	Mort's	do	do
Eatonfield do	Eatonville,	600	J. Clark's	do	Winfield,
Locust Grove do	do	150	N. Bartlett's	do	do
Mohawk Valley, do	E. Schuyler,	450	N. Winfield	do	N. Winfield,
Richardson's do	do	350	Moon's	do	Russia,
Budlong's do	W. Schuyler,	300	Poland Cheddar	do	Poland,
Warren's do	Warren,	400	Herkimer	do	Herkimer,
Fort Herkimer do	Fort Herkimer,	400	Herkimer Union	do	do
Bellinger's do	do	400	G. W. Pine's	do	do
Beckwith's do	Cedarville,	300	Newport	do	Newport,
Cold Spring do	do		Morey's	do	do
Stewart's do	do		White Creek	do	do
Howard's do	do		Cold Creek	do	do
Cedarville do	do	300	Cook, Ives & Co.	do	Salisbury,
Smith's do	Frankfort,	800	Stratford	do	do
A. G. Norton's do	do		Old Salisbury	do	do
Frankfort Center do	do		Avery & Ives	do	Salisbury Centre,
Russell's do	Russell's Hill,		Brockett's Bridge	do	Brockett's Bridge,
Wetmore do	do		Brockett & Feeter	do	do
D. Hawn's do	Starkville,	800	Keys'	do	do
Snell's do	Russia,	600	Norway Associa'n	do	Norway,
Nash's do	Frankfort Center,		J. D. Ives'	do	do
Rider's do	Cedar Lake,		Columbia Center	do	Columbia Center,
Stuart's do	Cedarville,		J. Russell's	do	Graefenberg,
Richardson's do	W. Schuyler,				

OSWEGO COUNTY.

M. Pierce's	Factory,	So. Richland,	300	Fairdale	Factory.	Fairdale.
Gilbert Mills,	do	Gilbert Mills,	430	McMullen's	do	Hinmanville,
Dick's	do	Pennellville,		Mead's	do	E. Sandy Creek,
Volney Center,	do	Volney,	310	Bander's	do	Caughdenoy,
Whitemore's	do	Scriba,	500	Smith's	do	New Haven,
Ingell & Smith's	do	Volney,	375	Daggert's	do	do
E. Sandy Creek	do	E. Sandy Creek.		Donnelly's	do	North Scriba
Robbins & Co.'s	do	do	600	S. W. Oswego	do	
Snydam's	do	do	400	Vermillion	do	Vermillion,
Trumbull's	do	Pulaski,	270	Smith's	do	Volney,
Hall's	do	do	300	Hubbard's	do	250
Cold Spring	do	do	300	Jennings'	do	Palermo,
Jones'	do	South Richland,	400	East Scriba	do	200
L. Willis'	do	do	300	Sweet's	do	Schroepfel,
Blunt's	do	Orwell,	150	Gregg's	do	do
Union	do	Colosse,	400	First National	do	Phœnix,
Union	do	Mexico,	500	Central Square	do	Central Square,
Weygant's	do	Prattville,	530	West Mannal	do	225
Bamaska's	do	Phœnix,		Granby Center	do	220
Morton's	do	Orwell,	600	Rhodes	do	Scriba,
Sweet's	do	Phœnix,		Union	do	Sandy Creek,
Smith's	do	Hastings,		Union	do	Scriba,
Hastings C. M. Co. do	do	do		Amboy	do	Amboy Corners,
Oswego Center	do	Oswego Center,	400	Smith's	do	Fulton,
Bowen's Corners	do	Bowen's Corners,		Loomis'	do	Palermo,
Wilcox's	do	Oswego Falls,		Clough & Co.'s	do	Constantia,
W. Monroe C. M. A. do	do	West Monroe,		Cold Spring	do	Richland,
Titus & Wilson	do	Hannibal,		P. Wyman's	do	Orville,
Gardner's	do	S. Hannibal,		Molino	do	Molino,

WAYNE COUNTY.

Walworth	Factory,	Walworth,	300	Wilbur's	Factory,	Newark,
Butler Center,	do	Butler Center,	240	Lincoln	do	W. Walworth,
Williamson,	do	Williamson,		Marion	do	Marion,
Palmyra,	do	Palmyra,		Lee & Sheffield's	do	Rose,
Safford's	do	Savannah,	175	Alloway	do	Lyons,
South Butler,	do	South Butler,		Naings	do	do
Macedon,	do	Macedon,	300			

FRANKLIN COUNTY.

Berry Butter	Factory,	Malone,		Malone No. 1	Factory.	Malone,
Moria	do	Moria,		Fort Covington	do	Fort Covington,
Keeler	do	Malone,		F. C. Center	do	Fort Cov. Center,
Cold Spring	do	do		Sargent's	do	South Bangor,
Union	do	Bangor,		Patterson	do	Chataugay.
Bombay	do	Bombay,		Barley Spring	do	

COLUMBIA COUNTY.

Hudson	Factory,	Hudson,		Chatham	Factory,	Chatham Center.
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WYOMING COUNTY.

George Hoye's Factory,	Attica,		Tozier's	Factory,	Johnsonburg,
Java Village	do	Java Village, 450	Sheldon C. M. A.	do	Sheldon,
North Java	do	North Java,	Wyoming	do	Wyoming,
Stryker & Co.'s	do	do	Chapman's	do	Perry,
Empire	do	Java, 400	Hermitage	do	
Arcade C. M. A.	do	do	Orangeville	do	Orangeville, 600
Nile	do	Nile,	Wilder & Co.'s	do	do
Bennington	do	Bennington, 400	Strykersville	do	Strykersville,
East Bennington	do	East Bennington, 375	E. Coy	do	Pike,
Arcade	do	Arcade, 500	Lillibridge	do	do
Wells'	do	do	Empire	do	East Pike,
Castile	do	Castile, 400	Oatka	do	Gainesville,
Gardlant's	do	Attica,	Cowlesville	do	Cowlesville
Chapman's	do	Paris Center,	Java Lake	do	350
Stephens'	do	Dale			

WASHINGTON COUNTY.

North Bend	Factory,	N. Granville,	S. Granville	Factory,	South Granville,
North Bend	do	Middle Granville, 250	Middle Granville	do	Middle Granville, 500
Granville	do	Granville, 450	Greenwich	do	Greenwich, 135
Fort Ann	do	Fort Ann.	Hawley's	do	For. Edward,

NIAGARA COUNTY.

Sanborn C. M. Comp'y,	Sanborn,	300	Middleport	Factory,	Middleport,
Johnson's Creek	do	Johnson's Creek,	J. C. Francis'	do	do

BROOME COUNTY.

Maine	Factory,	Maine, 250	Squires' Cr.	Factory,	Kirkwood, 275
Hawleyton	do	Hawleyton,	Page Br'k Valley	do	North Fenton, 500
Killawog	do	Killawog.			

ONTARIO COUNTY.

Cold Spring	Factory,	West Farmington, 450	E. Bloomfield	Factory,	East Bloomfield,
Flint Creek	do	Flint Creek,			

ERIE COUNTY.

Stickney's	Factory,	Collins, 1,000	Boston	Factory,	Boston, 400
W. G. Huntington	do	Pontiac, 800	Concord Center	do	Woodward's Hol. 500
North Concord	do	Concord.	Wales	do	Wales, 450
First Collins	do	800	Paxton's	do	Eden, 600
Collins Center	do	Collins Center, 1,100	Sisson's	do	Shirley, 600
Brant Center	do	Brant, 550	North Evans	do	North Evans, 500
Marshfield	do	Collins Center, 1,100	Angola	do	Angola, 360
Morton's Corners	do	Morton's Corners, 600	Stickney's	do	Brant, 400
Richmond & Co.'s	do	Sardinia, 500	Springville	do	Springville, 1,200
Glenwood	do	Glenwood, 400	Blakeley's	do	East Aurora,
Dick & Co.'s	do	Wilink, 350	Jackson's	do	East Hamburg, 300
North Collins	do	Shirley,	Hamburg	do	Hamburg, 300
Kirby's	do	do	North Evans	do	North Evans, 250
Young's	do	Alden, 300	East Evans	do	East Evans, 300
Wheelock's	do	300	Eden Corners	do	Eden Corners, 350
Staffin's	do	200	Sardinia Valley	do	Sardinia Valley, 450
W. Smith's	do	Collins, 300	Newton	do	Sardinia, 250
Ballard's	do	350	Hosmer's	do	do
Hensler	do	Grand Island, 150	Wales Center	do	Wales Center, 400
Cotesworth	do	do	Fuller's	do	do
North Boston	do	100	South Wales	do	Wales, 450
Boston Center	do	450	Elma	do	do
Colden	do	350	Burrongs & Co.	do	do
Marilla	do	Colden, 300	Francis	do	
Kimball's	do	Marilla,	Farrington's	do	Holland,
Cheese M. A.	do	Lancaster,	Monlton's	do	Protection,
		Spring Brook,			

MONROE COUNTY.

Genesee Valley Factory,	Sonyea,	300	Mendon	Factory,	Mendon,
Riga	do	Riga,	Perinton	do	Fairport,

CAYUGA COUNTY.

A. P. Cook's	Factory,	Cato, 300	Ira	Factory,	Ira,
Throopsville C.M.A.	do	Throopsville, 450	Lincoln's	do	Conquest Center, 400
Moravia	do	Moravia, 250	P. Byron C.M.Co's	do	Port Byron,
Sennett	do	Sennett, 400	Meridian	do	Meridian, 200
Carpenter's	do	New Hope,	Montezuma	do	

TOMPKINS COUNTY.

Dryden Union	Factory,	Etna, 600	Freeville Un.	Factory,	Freeville, 700
Groton	do	Groton Hollow, 500	Slaterville	do	Slaterville,
Ellis Hollow	do	Ithaca,	Peru	do	Peruville,
McLean Associa'n	do	McLean, 700	Rridgew'y Cream'y	do	Caroline Depot,

ORANGE COUNTY.

Circleville	Factory,	400	Wood's	Factory,	Chester,	200
Collaburg	do	220	Kidd's	do	Walden,	
Rockville	do	200	J. F. Vail & Co.	do		450
Unionville	do	250	Brown, Lane & Co.	do		50
Walkill Associa'd	do	375	Wawanda	do		375
D. Mullock's	do	250	J. B. Halsey & Co.	do		300
Orange Co. M. A.	do	550	E. Bull's	do	Chester,	159
do	do	325	Bankers Bro.'s	do	do	200
Gouge & Co.	do	600	F. Davis'	do	do	125
Bates & Co.	do	250	P. Holbert's	do	Middletown,	275
Gouge & Youngs'	do	400	Mapes & Co.	do	do	425
T. J. Taylor's	do	175	Jas. Hulse	do	do	250
Carpenter Howell	do	415	Wm. Mead & Co.	do	do	250
do	do	350	Christee & Co.	do	Unionville,	300
Sanford & Smith	do	300	O. F. Green	do	Greenville,	300
H. Milburn	do	250	H. Reamy	do	do	125
T. Durland	do	150	Finchville	do	Otisville,	375
Brown, Bailey & Co	do	400	J. A. Wood's	do	Slate Hill,	300
Foster Clark's	do	350	Howell & Co.	do	Monroe,	400
W. H. Clark & Co.	do	300	Sugar Loaf	do	Sugar Loaf,	550
Barton Spring	do	100	Union Cond Milk Co.	do	New Milford,	
Parlor	do	Blooming Grove,				

GREENE COUNTY.

Towner's	Factory,	Jewett,	Smith's	Factory,	Ashland,
Hunter's Cream'y	do	do	Kirkland	do	Durham.

ALLEGANY COUNTY.

Simpson's	Factory,	New Hudson,	600	Morley's	Factory,	Whitney's Crossing,	
Reservoir	do	Seymour,	600	Flanagan's	do	Cole Creek,	
Rushford	do	Rushford,	1,000	Crandall's	do	Dodge's Corners,	
Forsythe's	do	Whitesville,	200	Belydere	do	Belvidere,	
S. Sherman & Co	do	Nile,	125	Rice's	do	do	
Richburg	do	Richburg	100	Granger	do	Granger,	
Curtis'	do	do		Little Genesee	do	Little Genesee,	
D. T. Burnick's	do	Alfred,	400	Carr Valley	do	Almond,	400
Greene's	do	do		A. Congdon's	do	West Clarksville,	250
Friendship,	do	Friendship,	400	Babbit's	do	Hume,	350
Centerville,	do	Centerville,	400	Phillips Creek,	do	Phillips Creek,	450
Ackerley's	do	Rushford,	600	Vandermarsh	do	Scio,	275
Barns'	do	Filmore,	700	R. Smith's	do	Cuba,	350
Andover	do	Andover,	350	West Almond	do	West Almond,	
Black Creek,	do	Black Creek.	400	G. West's	do	Alfred Center,	
Oramel	do	Oramel,	450	J. Wilcox's	do	Wirt Center,	150
Niel	do	do	250	Wiscoy	do	Wiscoy,	200
Wellsville	do	Wellsville,	300	Genesee	do	Little Genesee,	120
Lyndon	do	Cuba,	700	Elm Valley	do	Andover,	150
Pettibone's	do	Alfred,		Angelica	do	Angelica,	
Dodge's Creek	do	Portville,		Olean	do	Olean,	356
Jackson's	do	Belmont,		McHenry Valley	do	Alfred Center,	300

YATES COUNTY.

Italy Hollow C. M. A., Italy Hollow.

PUTNAM COUNTY.

Borden's Condensed Milk Factory, Brewster.

OTSEGO COUNTY.

Wykoff's	Factory,	Richfield Springs,	300	Russell Bowers' Factory,	Exeter,	300	
Bush's	do	do		Perkin's	do	do	
E. D. Lamb's	do	Unadilla Forks,	350	Hind's	do	Cooperstown,	
Center Brook	do	Otsego,	300	Hoxie's	do	do	
Stocker & Fox's	do	East Springfield,	300	do	do	Unadilla Forks,	
Casler & Andrews	do	Springfield Center,	450	R. L. Warren's	do	East Springfield,	
Hartwick	do	Hartwick,	200	West Burlington	do	West Burlington,	300
Pitt Cushman's	do	Edmeston Center,	200	Parker's	do	S. Edmeston,	400
Col. Gardner's	do	Burlington Flats,	150	Pope's	do	do	300
Ed. Gardner's	do	do	150	L. N. Brown's	do	W. Edmeston,	600
Benj. Smith's	do	Spoooner's Corn'rs,	400	Ed. Loomis'	do	Richfield,	150
Brockway's	do	Richfield,	400	L. O. Vebber's	do	Exeter Center,	600
Smith & Wilber	do	West Exeter,	400	H. & S. Smith's	do	W. Exeter,	300
Fly Creek	do	Fly Creek,	200	J. H. Pratt's	do	do	400
Park's	do	Burlington Green,	350	Lyman Johnson	do	Burlington Flats,	500
Parley Phillips'	do	Unadilla Forks,	200	Coleman's	do	do	200
Wm. L. Brown's	do	do	200	Newel N. Talbot's	do	do	
Clark's	do	Schuyler's Lake,	200	Hartwick Union	do	Cooperstown,	
Edmeston Center	do	Edmeston Center,	750	Chamberlain's	do	Richfield Springs,	
Warren Chase's	do	W. Edmeston,	250	Cherry Valley	do	Cherry Valley,	300
Joseph King's	do	Burlington Green,	200	Tuttle's	do	South Edmeston,	350
George Clark's	do	Hyde Park,	300	Rider's	do	Schuyler's Lake,	100
Nearing & Co.'s	do	Butternuts,		Baker's	do	do	600

SCHENECTADY COUNTY.

Mariaville Factory, | Rotterdam Factory,

GENESEE COUNTY.

Batavia Union Factory, do C. M. A.	do	Batavia, do	500	Darien Center Factory, Oakfield	do	Darien Center, Oakfield	400
Byron	do	Byron,		W. Bethany	do	West Bethany,	
Richville	do	Pembroke,		East Bethany	do	East Bethany,	
Linden	do	Linden,		Foster's	do	Batavia,	
Stafford	do	Stafford,					

FULTON COUNTY.

Stuart's	Factory,	Oppenheim Center,		Cold Brook	Factory,	Brockett's Bridge,	
Fulton	do	do		Brockett's Bridge	do	do	
Cross Roads	do	Johnstown,	350	Perth Center	do	Perth Center,	200
Stollar's	do	do		Slate Hill	do	Epharth,	600

SARATOGA COUNTY.

Ballston	Factory,	Ballston Center,		Galway	Factory,	Galway,	
Empire	do	South Galaway,	250	Charlton	do	Charlton,	

CATTARAUGUS COUNTY.

Welch's	Factory,	Dayton,		Farmersville	Factory,	Farmersville,	400
Perrysburgh	do	Perrysburgh,	550	Cook & Brothers	do	do	
Ticknor's	do	Versailles,	500	Napier	do	do	
Slab City	do	Slab City,		J. K. Button's	do	do	
Leon Center,	do	Leon Center,		Ischua	do	Ischua,	
Randolph	do	Randolph,	200	Portville	do	Portville,	
First Collins	do	Gowanda,	700	Olean	do	Olean,	
Stebbin's	do	Cattaraugus,		Hillsdale	do	Hillsdale,	
Waverly	do	Waverly,		Rock Spring	do	Franklinville,	600
Safford's	do	East Otto,		Union	do	Ellicottville,	600
Union	do	do		McMahon's	do	do	
Tift's	do	do	400	Meadow Valley	do	do	
Crump's	do	do		Little Valley	do	Little Valley,	
Ashford's	do	Ashford,	600	Great Valley	do	Great Valley,	
Westville	do	Westville,		Merrilly's	do	Napoli,	
West Ashford	do	Ashford Hollow,		Lyndon	do	Lyndon,	
Machias Corners	do	Machias Corners,		Cadiz	do	Cadiz,	850
Woodworth's	do	Yorkshire,	450	New Ashford	do	New Ashford,	400
Maple Ridge	do	Fairview,	660	Yorkshire Center	do	Yorkshire Center,	500
Gowanda	do	Gowanda,	550	New Albion	do	do	600
Dwight's	do	do		Jenk's	do	Gowanda,	1,000
Allen's	do	Eddyville,	350	Pigeon Valley	do	do	369
Maple Grove	do	Ellicottville,	200	West Valley	do	West Valley,	400
E. Ashford	do	East Ashford,	550	Ballard	do	do	
Follett's	do	Machias,	400	Bigelow's	do	Ashford,	
Lewis & Haskell's	do	Sandusky,		Vedder Corners	do	do	
Elton	do	Elton,	400	Gamp's	do	Ashford Hollow,	
Rawson	do	Rawson,					

LEWIS COUNTY.

Sulphur Spring	Factory,	Lowville,	500	Barnes Corn's Factory.	Pinckney,		
G. Austin's	do	do	500	Edmund Sheldon's	do	Copenhagen,	300
Lowville	do	do	850	Campbell's	do	do	100
Union	do	do	250	G. C. Youngs'	do	do	170
West Lowville	do	do	500	W. W. & A. D. Vorce	do	do	270
S. Harrisburgh	do	do	370	Copenhagen	do	do	250
Alexander's	do	do	110	N. Clark's	do	do	200
Harrisburgh	do	Harrisburgh,	600	J. M. Wallace's	do	Denmark,	425
G. D. Ryel's	do	Copenhagen,	285	Stony Brook	do	do	800
Lanphere's	do	do	200	Haddock's	do	do	370
River Street	do	do	250	Wm. Glenn's	do	Watson,	400
Houssville	do	Houssville,	650	Lyon's	do	Lyon's Falls,	150
Orrin Carpenter's	do	Turin,	200	Martinsburgh	do	Martinsburgh,	700
Welsh Hill	do	do	330	E. G. Dodge's	do	do	250
Turin	do	do	550	John Smithling's	do	do	308
Horatio Phillips'	do	do	500	Wm. Williams	do	do	750
J. T. Miller	do	Constableville,	1,000	W. Martinsburgh	do	do	500
M. Donald's	do	do	300	Union	do	do	400
Valley	do	do	550	John Rees'	do	do	200
H. C. Markham	do	West Turin,		Crystal	do	New Bremen,	340
Closner's	do	High Market,		Cold Spring	do	do	500
C. & G. Plummer	do	do	400	Joseph Shear's	do	do	200
Wilder's	do	do	400	Beaver Falls	do	Croghan,	200
Sugar River	do	Leyden,	500	Michael Baker	do	do	200
Leyden Cheese A.	do	do	520	Iris Creek	do	do	350
D. D. Carpenter	do	Pinckney,	100				

DUTCHESS COUNTY.

Sheldon's	Factory,	Stissing,	
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CLINTON COUNTY.

Platt's	Factory,	Plattsburgh,		Smith Dale	Factory,	Peru.	
Rouse's Point	do	Rouse's Point,					

ORLEANS COUNTY.

Cooley & Thompson's	Factory,	Albion.	
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STEUBEN COUNTY.

Spalding's	Factory,	Howard,	400	J. Davis'	Factory,	Greenwood,	250
Bennett's	do	do	500	Mason's	do	North Cameron,	400
Kanona	do	Kanona,	300	Spalding & Co.	do	Avoca,	
Wing's	do	Campbell,		Sitterly's	do	Bath.	

ONONDAGA COUNTY.

L. H. Webster's	Factory,	Fabius,	500	Belle Isle	Factory,	Belle Isle,	
Delphi	do	Delphi,	450	Sherwood's	do	Brewerton,	
Salisbury's	do	Apulia,	600	DeWitt C. M. A.	do	DeWitt,	300
Coppernoll's	do	Lysander,		Talbot	do	Fabius,	400
Edward's	do	Mannins,		Euclid	do	Euclid,	
Hopper's	do	Collamer,	160	Navarino	do	Navarino,	140
Hiscock's	do	Jamesville,		Kirkville	do	Kirkville,	450
Seneca,	do	Baldwinsville,	150	Camp's	do	Orisco,	200
Spafford	do	Spafford,		Little Utica	do	Little Utica,	300
Loomis'	do	Cicero,		Cole Settlement	do	Fabius,	150
Van Bramer's	do	do		Block School Ho.	do	do	
Sternberg's	do	Cicero Center,		Southard's	do	Pompey Center,	
Delphi	do	Delphi,		Palmer C. M. A.	do	Oran,	250
Elbridge	do	Elbridge,	400	Plainville	do	Plainville,	400
Tully	do	Tully,		Young's	do	Euclid,	
Jack's Rift's	do	Jack's Rift's		Marcellus	do	Marcellus.	

SCHUYLER COUNTY.

Cook & Co.'s	Factory,	Havana,		Alpine	Factory,	Alpine.	
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CHAUTAUQUA COUNTY.

Hamlet	Factory,	Hamlet,	1,100	Brainard's	Factory,	Hamlet,	650
J. E. Robertson's	do	Busti,	660	Coon's	do	(3) Mina,	1,250
Clear Spring	do	Fredonia,	700	do	do	Sherman,	457
Burnham's	do	Sinclairville,	1,049	Canadawa	do	Arkwright,	680
J. S. Hulbert's	do	Forrestville,	400	Gerry	do	Gerry,	500
Villanova	do	Villanova	400	Cassadaga	do	Cassadaga,	400

CHEMUNG COUNTY.

J. S. Holbert's	Factory,	Chemung,	250	H. C. Hoffman's	Factory,	Horseheads,	650
Bunnell & Horton's	do	Millport,	750	Van Duzer & Son's	do	do	400

TIOGA COUNTY.

Speedsville	Factory,	Speedsville,		Jenksville	Factory,	Jenksville.	
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SCHOHARIE COUNTY.

Sharon Center	Factory,	Sharon Center,	250	Argusville	Factory,	Argusville,	600
Seward Valley	do	Seward,	200	Carlisle	do	Carlisle,	300
Hindsville	do	Hindsville,	300	Barneyville	do	Barneyville,	200
Gardnersville	do	Gardnersville,		Esperance	do	Esperance.	
Cobleskill	do	Cobleskill.					

RENSSELAER COUNTY.

Matteson's	Factory,	South Berlin.	
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MONTGOMERY COUNTY

Charleston 4 Corners	Factory,		400	Root	Factory,	Root,	500
Smith Creek	Factory,	Fort Plain,	300	Wier's	do	do	
Dunkle's	do	do		Glen	do	Glen	400
Root's	do	do		Dieffendorf's	do	Amsterdam,	300
Empire Cheddar	do	Burtonville,	300	W. Green's	do	do	
Florida	do	do	400	Dorn's	do	do	
Hallsville	do	Hallsville,	400	Florida	do	Minaville,	
Freys Bush	do	Freys Bush,	550	Minaville	do	do	450
Hessville	do	Sprout Brook,	270	Switzer Hill	do	Fonda,	350
Cold Spring	do	Stone Araba,	250	Schuyler's	do	do	
Waterville	do	Ames,	600	Mohawk Valley	do	do	250
Flat Creek	do	Flat Creek,	450	Cold Spring	do	Palatine Bridge,	
Brookman & Co.	do	Fort Plain,	600	Union	do	do	559
Ford's Bush	do	Minden,	450	Failing's	do	do	
Cayadutta	do	Fonda,	600	Gatesville	do	Randall,	
Bates, Suel & Co.	do	St. Johnsville,	350	Mother Creek	do	St. Johnsville,	350
St. Johnsville	do	do	600	Buel	do	Buel,	550
Charleston	do	Charleston,	350	Mapletown	do	do	
Charleston Union	do	do	250	Kilt's	do	Canajoharie,	330
S. Zoller's	do	do	200	Zimmerman Creek	do	do	350
Wm. Dunchell's	do	do	350	Klock & Nellis	do	do	350
Sand Hill	do	do	330	Slate Hall	do	do	550
Seeber Lane	do	do	300	Christman	do	do	250
Elm Dale	do	do	240	Spraker	do	do	400
Van Epps	do	do	150	Grove	do	do	200
Maple Grove	do	do	200	Dairyman	do	do	300
Bates	do	do	400	Scotch Church	do	do	300
A. Smith & Co.	do	do	450	Pawling	do	do	300

Ohio.

GEAUGA COUNTY.

Rocky Dell	Factory,	Bissell's	250	Spring Brook	Factory,	Welchfield.	300
Andrews'	do	do	800	Grove	do	do	370
Bartlett's	do	Chester X Roads,	800	Munson's	do	Fowler's	400
do	do	Mulberry Corners,	300	Pope's	do	Welchfield,	500
Hood's	do	Auburn,	500	Randall's	do	Barton,	700
Odell's	do	do	600	Hall's	do	Claridon,	400
Smith's	do	Ford,	600	Armstrong	do	East Claridon,	700
Freeman's	do	South Newberry,	500	Smith & Co.'s	do	Parkman,	600
Hall's	do	Fowler Mills,	600	Armstrong's	do	Huntsburgh,	800
Murray's	do	Chardon,	800	Randall's	do	Montville,	800
Randall's	do	do	700	Murray's	do	do	500
Russell's	do	Nelson,	500	Smith's	do	Thompson,	500
Colton & Co.	do						

PORTAGE COUNTY.

E. B. Higley, Windham.		H. F. Hudson, Ravenna.	
Horr & Ridsen, Shalersville.		Beman Spring, "	250
H. S. Johnson, Garrettsville.		Hinkley's, Mantua,	400
Hurd & Bro., Aurora.		Burrows, Freedom.	
T. C. Bradley, Mantua.		Aurora Grove, Aurora.	500
I. C. Scram, Ravenna.		Anderson's, Ravenna,	300

LAKE COUNTY.

S. E. Carter, Leroy, Painesville P. O.		Hitts, Willoughby.	* 300
H. N. Carter, Perry.		Bartlett & McKee, South Kirtland.	
R. Freeman & Co., Madison.			

ASHTABULA COUNTY.

S. E. & H. N. Carter, Windsor.	500	Wire's, Austinburgh,	400
Lattimer's, New Lyme.		Weldon & Brown, Conneaut.	
Osborne's, Morgan.		Pierce's, Eagleville.	
G. C. Dolph, West Andover.		Harrington & Randall, Morgan.	
Austinburgh, Austinburgh.		Elderny, New Lyme.	
Morley Bros., Andover.			

TRUMBULL COUNTY.

T. M. Trew, Newton Falls.		Baldwin's, Fowler.	
B. H. Peabody, Kinsman.		Cortland, Bazetta.	
Cold Spring, do		Raymond's, Mesopotamia.	
Caldwell & Lewis, W. Farmington.		Cowdery & Crafts, Bazetta.	
Farmington Center.		Sager & House, Bristolville.	
E. C. Cox, Mesopotamia.		Harshman & McConnell's, Southington.	
do N. Bloomfield.			

HENRY COUNTY.

Ridgeville Factory, Ridgeville Corners.

FAIRFIELD COUNTY.

Royalton Factory, Royalton.

LORAIN COUNTY.

Camden Cheese Company, Kipton.		Snow's, Huntington.	
Mussey & Viets, Elyria.		G. H. Van Wagnen & Co., North Eaton	
Horr & Warner, Huntington.		Corning & Hance, Grafton.	
Magraugh & Whitlock, Wellington.		Penfield, Wellington.	

MEDINA COUNTY.

McDowell Bros', Medina.		Crane & Co., Sharon.	
Fellows, Chatham.		Colbetzes & Co., Spencer.	
Benedict & Brooker, Litchfield.		Chatham, Chatham Center.	

SUMMIT COUNTY.

Twinsburg Cheese Association, Twinsburg.		Richfield, W. Richfield.	
Wm. Wilcox, Twinsburg.		S. Straight & Co., Streetsboro.	
S. Straight & Co., Twinsburg.		Oak Hill, Peninsula.	
do do Hudson.		M. D. Call, Hudson.	

ASHLAND COUNTY.

Drake, Eaton & Co.'s, Sullivan.		Clark & Bailey, Sullivan.	
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EURON COUNTY.

Haviland & Conant, Greenwich.		Wakeman Cheese Co., Wakeman.	
J. W. Jenne, New London.			

CUYAHOGA COUNTY.

A. J. Lockwood, Bedford.		Wyatt's, Breckville.	
J. Q. Lander, Solon.			

Illinois.

Hainesville	Factory.	Hainesville, Lake co.	Gould & Ham-			
Burchard's	do	Sumner, Kane co.	mond's	Factory,	Elgin,	425
Patterson & Mix	do	Momence, do	Tuttle's	do	Lodi,	350
Wm. Keeney's	do	Mantino, do	Barber & Co.	do	Polo,	300
W. C. Richard's	do	Momence, do	Albro & Co.	do	Wayne,	600
W. A. Clark's	do	Sherburnville, do	Winslow	do	Shirland,	400
Wanzer & Co.	do	Herman, Kane co.	Kilbor's	do	Richmond	
R. R. Stone's	do	Richmond, McHen-	Buckland's	do	Ringwood,	
do	do	ry co.	Jones'	do	Hebron,	
do	do	800	Conn's	do	do	
Thompson & Ab-		Spring Grove,	Woodstock	do	W'dstock, McHenry co	
bott	do	Greenwood, do	Riley	do	Riley, do	
Huntley Grove	do	Huntley, do	Buena Vista	do	Huntley, do	350
Marengo	do	Marengo, do	Spring Grove	do	Richmond, do	300
Greenwood	do	Woodstock, do	Garden Prairie	do	Garden Prairie,	
Marsh & Jackson	do	Union, do	Mead's	do	Hebron,	300
Boies	do	Kingston, DeKalb,	Milk Condensing Co.	do	Elgin,	
Sugar Grove	do	360	Rockton	Factory,	Rockton,	400
Dunton	do	Aurora,	Stuart Bros.	do	Hebron, McHenry co.	500
Kennicott	do	Dunton,	Onida	do	Rockford,	
Cameron	do	do	Belvidere	do	Belvidere, Boone co.	
Perry	do	do	Hale	do	Hale, Ogle co.	
Williams	do	do	Wanzer's	do	Hanover,	
Gould & Hammond's	do	Hanover,	do	do	Elgin,	
		425	Cameron	do	Northfield.	

Massachusetts.

Worcester Co. Factory,	Warren,	500	New Lenox	Factory,	Lenox,	
Union	do	Hardwick,	Cheshire	do	Cheshire,	
New Braintree	do	New Braintree,	Petersham Cheese Co.,	do	Petersham,	
Barre Cent'l Cheese Co.	do	Barre Center,	Cheshire	do	South Adams,	
Barre Cheese Co.,	do	Barre,	Westboro	do	Westboro,	
South West Factory,	do	do	Lewis Milk C. Factory,	do	W. Brookfield,	
Hardwick Center	do	Hardwick,	Coy's Hill Cheese Co.,	do	Warren,	
Boies's	do	Blandford,	S. Williamst'n Factory,	do	S. Williamstown,	300
Williamstown	do	Williamstown,	Walker's	do	Greenwich,	
West Brookfield	do	West Brookfield,	Dana C. M. C.	do	Dana,	
Lanesboro	do	Lanesboro,	Putnam's	do	Belchertown,	
North Marlboro	do	North Marlboro,	Slater's	do	Tyringham,	
Lenox	do	Lenox,	Greylock	do	South Adams,	
Hardwick Union	do	Gilbertsville,	Pierce's	do	Peru,	
Warren	do	Warren,	Greenfield	do	Greenfield.	

Vermont.

East Berkshire Factory,	East Berkshire,	400	Mason's	Factory,	Richmond,	80
Enosburgh Factory Co.	Enosburgh,	600	Valley	do	Hinesburg,	550
N. Enosburgh Factory,	N. Enosburgh,	400	East Poultney	do	East Poultney,	300
East Franklin	do	East Franklin,	Wallingford	do	Wallingford,	
Middletown	do	Middletown,	Williams	do	Damby,	
Rose	do	West Rupert,	Rutland	do	Rutland,	
West Pawlet	do	West Pawlet,	West Orwell	do	Orwell,	450
Hill	do	Middletown,	East Orwell	do	do	350
West Timmouth	do	West Timmouth,	Hosford's	do	Charlotte,	350
Norton's	do	Wells,	Milton	do	Milton,	
Valentine's	do	Timmouth,	Milton Falls	do	Milton Falls,	
Otter Creek	do	Center Rutland,	Ferrisburgh	do	Ferrisburgh,	
Billing's	do	Rutland,	New Haven	do	New Haven,	
Sheldon's	do	West Rutland,	Shoreham	do	Shoreham,	
Wickham's	do	Pawlet,	Union	do	Hinesburgh,	
Camp's	do	Stowe,	Mankton Pond	do	do	
Missisquoi	do	North Sheldon,	Lewis Creek	do	do	
Gleason's	do	Shrewsbury,				

Iowa.

Smith's	Factory,	Mason City,	Straw'ry Pt. Factory,	Fayette Co.
Hickling's	do	do	Kidder's	do
Wyoming	do	Wyoming, Jones Co.,	Pierce's	do
Clear Lake	do	Clear Lake,		Belmond.

North Carolina.

Elk Mountain Factory, Buncomb Co.

Wisconsin.

C. H. Wilder's Factory,	Evansville, R'ckCo400	D. Treleven's Factory,	Fond du Lac,	150
Springvale	do Nanaupa,	A. J. Smith's	do	75
Eldredge	do Afton,	Ellsworth's	do Rosendale,	150
Elkhorn	do Elkhorn,	Johnson's	do Kenosha,	
Rosendale	do Ros'le, F.duLacCo500	Long's	do do	
Hazen's	do Ladoga, do 800	Pierce & Simons	do do	
Hazen & Co's	do Brandon,	Truesdell's	do do	
Sparta	do Sparta,	White's	do do	
Favil's	do Lake Mills, Jeff. Co.	Ft. Atkinson	do Ft Atkinson.	
Barrett's	do Burnett Station.	Spring Mills,	do Somers,	
Coolidge	do Windsor, Dane Co.	Bullock's,	do Rockton,	
Waterville	do Wat. Waukesha Co.	Cold Spring	do Whitewater,	
Boynton's	do Waupan,	Coburn's	do do	
Howard's	do do 300	Drake's	do Lake Mills,	
Johnson's	do do	Gilbert & Co.'s	do Hazel Green.	
Downey's	do do 175	Tappan's	do Morrison,	
Carpenter's	do Kenosha,	Wilbur & Co.'s	do Wilmont,	
Holt's	do do	Strong & Co.'s	do Oakfield,	
J. Comb's	do Ripon,	Cochran's	do BeaverDam,Dodge	
Hodge's	do 125	Reigart & Ross	do Beloit.	

Michigan.

St. Clair	Factory,	St. Clair,	450	Mason	Factory,	Mason,	
Fairfield	do	Fairfield,	700	Irish's	do	Grand Lodge,	
Horton's	do	Adrian,		Spring Brook	do	Farmington,	400
Hoadley's	do	Oakford,		Gilt Edge,	do	do	400
Saunders	do	Trenton,		Ionia	do	Ionia	
Smith's	do	Augusta,		Reading	do	Reading,	450
White's	do	Ceresco,		Fowler & Co.'s	do	do	
Maple Grove	do	Farmington,	600	Adrian C. M. Co.	do	Adrian,	
Canton	do	Canton,	400	Ames'	do	Hudson,	
Beal's	do	Rollin,		Sawin's	do	Mattison,	
Clayton	do	Clayton,		Utica	do	Utica,	
Isham's	do	Wellsville,		Welton's	do	No. Adams,	
DeLano's	do	Oxford,		Hillsdale	do	Hillsdale.	

Pennsylvania.

Springville Factory,	Springville, Susq. Co.,	158	Cook's Factory,	Saegartown.
Bridgewater,	do Bridgewater	200	Logan & Co.'s Factory,	Hartstown.
Gage	do do do	200	Venango	do Venango, Crawford Co.
Worth's	do Marshalltown, Chester Co.		Cambridge	do Rockdale, do
Damascus Creamery,	Damascus, Wayne Co.		Ellis & Smith's	do Waterford, Erie Co.
Woodcock First Premium Factory,	Woodcock,		New Milford Creamery,	N. M., Susq. Co.,
	Crawford Co.		Spring Hill Factory,	S. H., Bradford Co.,
Woodcock Boro' Creamery,	Woodcock Boro',		Earl's	do Carthage.
	Crawford Co.		Edinboro	do Edinboro.
Keystone Factory,	North Richmond, Crawford		Nash's	do Crossingville.
Co.	Co.		Bentley & Co.'s	do Randolph.

Kentucky.

Chilesburg Factory,	Chilesburg, Fayette Co.	300	Versailles Factory,	Versailles, Woodford Co.,	200
Clark Factory,	Winchester, Clark Co.,	300	Madison Co. C. M. A.,	Richmond.	
Shelby City Factory,	Shelby City.				

Minnesota.

Anderson	Factory,	Mower City,		Owatonna	Factory,	Owatona,
Wells	do	Wells,		Havana	do	Havana,
Star	do	Rochester.		Dodge City,	do	Dodge City.

Virginia.

Holston Factory,	Saltville, Smith Co.		Old Dominion,	Hamilton.
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Tennessee.

Stratton's Factory, Crossville, Cumberland County.

Kansas.

Americus Factory, Americus.

Connecticut.

Eagle Cheese Company, North Colebrooke.

Indiana.

L. B. Merrill's Factory, Merrillville.

| Brockman's Factory, Crown Point.

Canada.

Smith & Son's, Norwich, Oxford Co., C. W.,	400	People's	Factory,	Norwich,	
Galloway's, Ingersoll,	do	Lossing's	do	Durham,	C. W. 250
Josian Collins, Mount Elgin,	do	Kearn's	do	Oxford,	do 200
Moyer's, West Zorra,	do	Dodge's	do	do	do 200
Adams', Nissouri,	do	Silverthorn's	do	do	do 70
Wade's, Cobourg,	do	Tho. Abram's	do	Norwich,	do 275
James Harris, Ingersoll,	do	G. Dunkin's	do	do	do 200
do Branch, Ingersoll,	do	Wm. Bailey's	do	do	do 125
H. Farrington's, Norwich,	do	Andrew Pickert, Lowville, Halton Co.	do	do	do 150
do Branch, Norwich,	do	Richard Carter, Brampton, Peel Co.	do	do	do 175
Chas. Banbury's, St. Mary's	do	Wilmont's, Milton, Hilton Co.	do	do	do 250
Harris & Adams, Mt. Elgin,	do	Cambell's	do	do	do 200
Scott's, Lobo,	do	Cochrane's, Compton,		C. E.	250
Ballard's, Norwichville,	do	Lawson's, Salford, Oxford Co.		C. W.	450
Ballantyne's, Sebringville,	do	Degeer's, Queensville,			
Ontario, Norwich,	do	Pearce, Tyconnell, Elgin Co.			
Pioncer, do	do	Middlesex Factory, Bowood.	C. W.		
E. Missouri Factory, Ingersoll,	do				

Nova Scotia.

Bridgetown.
Middletown.Wilmot.
Lawrencetown.Aylesford
Paradise.

AN ADDRESS

DELIVERED BEFORE THE AMERICAN DAIRYMEN'S ASSOCIATION AT
UTICA, N. Y., ON

WEDNESDAY, JANUARY 15TH, 1873.

BY

L. B. ARNOLD, ESQ.,

OF ROCHESTER, N. Y.

WORDS TO AMERICAN DAIRYMEN AND CHEESE-MAKERS, REVIEWING
GENERALLY THE CONDITION OF THE CHEESE INTEREST
IN THE UNITED STATES.

Mr. President and Gentlemen of the American Dairymen's Association :—The annual gatherings of your association have not only been profitable, but they have proved to be annual feasts, both intellectually and socially, to the dairymen attending. Intent upon progress, it is always interesting for men of the same vocation to meet for mutual improvement, but the meetings of your association have been most emphatically so. All of its conventions, which I have had the honor of attending, have, if you will allow me the use of a dairyman's simile, been composed of the cream of the dairying public. They have been made up for the most part of intellectual men who have taken a leading part in their calling. A conference of such material could hardly fail to be interesting, or to radiate an influence that would tell well upon any cause in which they were engaged. And this, I claim, the

discussions here conducted have done. Points which have most needed elucidation have been raised and considered; queries which single-handed experience might not have solved in years, if ever, have been answered on the spot. Here, from the practical man, have been drawn the lessons of his successful experience. Here the investigator has unfolded the new facts or laws which his hard labor or far-reaching thought has evolved. Here the scientist has been called to pour out from his storehouse of wisdom so much of his knowledge as applies to the branch of the industry you represent. Every class of attendants has been made to contribute something to the general good; even the inventor, whether he comes here to unburthen himself of a fancied shining conception of genius or mechanical skill; or to advertise his wares for gain, is sure to contribute something to the welfare of the cause, by making yearly some valuable addition to our already large stock of dairy apparatus. The thousands of watchful eyes observing, and of thoughtful brains laboring, in the cause of dairy husbandry throughout the country, cannot fail, in the course of a year's experience, to develop some new facts or features relating to the dairy, and your conventions are, as they have been, the most appropriate and natural channel through which to bring them before the public, after they have passed the hard ordeal of your criticisms. Much has been accomplished in this way. The production of milk as affected by food and drink, by health and disease, by treatment, mental as well as physical; the peculiar properties of milk, the character of its composition and the laws of preservation and destruction, its astonishing susceptibility to the action of ferments, have been thoroughly investigated and brought effectually to the attention of dairymen. New points in the management of milk and in the manufacture and curing of cheese, have yearly been brought forward; the keen eyes of discovery have pierced the dark recesses of the condensing factory, and the studiously concealed processes of the condenser's art, have, through your agency, been brought to light, and made accessible to all who may desire to know them. The organic nature of the active agency in rennet, and the theory of its peculiar mode of action, which has been a profound mystery for ages, have been explained and published at your conventions; and the astounding discovery that organic germs may be taken in the food or drink of a cow, and carried through her digestive and vascular system and appear in her milk with vitality retained, and there grow and multiply and affect the milk and its manufactured products, has been made and demonstrated.

These are proud achievements for any association, and their record on the pages of your valuable reports, are an eloquent testimony to the thoroughness and efficiency of your investigations, and the ability, as well as variety of talent embraced in your association. And yet the organization is only in its infancy. It is but eight years old. Its

present success is but an earnest of its future usefulness. But I do not propose to look into the future. I have only desired to call your attention briefly to some of the results already attained, and in the furtherance of this end I may say that the association has not only put the dairymen throughout the United States and Canada *en rapport* with each other, but it has put them in communion with other nations, and made the reading dairymen at least, acquainted with the best dairy practices and the state of the art in all the leading countries of Europe, and enabled them to appreciate the relation in which they stand to the dairy interest of the whole civilized world. In its practical effects it has greatly improved the quality of American cheese, and enlarged the channels of commerce to relieve the market of its surplus production. That much of the improvement in the quality of our cheese has grown directly out of the system of associated dairies, is evident; but that this association directly, and with the aid of its ramifications in the form of state, district, and county associations, has been a prominent cause of that improvement, is equally evident.

The part it has played in this respect may be seen by a comparison of the present condition of butter and cheese-making. Upon going into a hundred cheese factories in any district, the visitor will be struck with the almost exact sameness in the modes of procedure, and in the quality of the goods turned out, which he will find varying scarcely more than half a cent per pound in value. He will notice that the same treatment is given in them all to the milk on being received into the factory; it is heated to the same degree for receiving the rennet; coagulation is made to begin after an equal lapse of time in all alike; the time to commence cutting and working the curd goes on as if by electrical signals; the temperature for scalding, the time and manner of working, the condition of the curd when put to press, and the salt, vary but little. On all these and many other points large numbers of cheese dairymen in convention assembled, have compared notes and experiences; they have been the subject of earnest discussion and sharp criticism, till their merits have been sifted out and determined, and whatever has been found worthy has been very generally adopted. With butter-making it is different. Though an older and larger interest in the United States than cheese-making; though the press publishes very much more on the former than the latter, because editors and correspondents of newspapers, agricultural and otherwise, all know something about the former, while very few are familiar with the latter; though to less extent than cheese, butter is largely made on the associated plan, and ought, for all these reasons, to have the rules of manufacture better systematized than cheese. But it is the reverse. Among butter-makers very little is settled; they are at loggerheads on almost everything. The temperature at which cream rises best seems to be but little regarded and is known to but few; the best depth for

setting milk is argued all the way from one inch to twenty; the number who know just when is the best time for skimming milk, is very small; the time, temperature, and manner of churning, the effects of churning sweet or sour, and whether it is better to churn the whole milk or only the cream, are questions in dispute.

These differences grow out of the habit of working privately and alone, where each sees or knows little else than his own experiences. Improvements move slow when they go single-handed. Rapid progress in all the affairs of life comes from learning of each other. Difference, in butter-making could be as readily reduced as in cheese-making, by a comparison of results. But butter-makers are very little organized. Vermont, it is true, is working systematically to improve her butter interest, and the market reports of St. Albans show how well she has succeeded. I am glad to know that the champion of her noble work is to mingle in the discussions of this convention. The butter-makers of Western New York are following in the same course, and I hope they are also represented here. These are good beginnings and worthy of all praise. But what butter-makers now most need, with such minor organizations, is a national association, either independent or in connection with this, where large numbers from all parts of the country could compare practices and results, exposing defects and bringing the better practices before the public. We would gladly welcome them here. We believe the two interests are most appropriately discussed together. The manufacturer of either butter or cheese ought to be familiar with both, and it is to be hoped that not only the other wing of the dairy interest will be more and more fully represented here, but that all branches of dairy husbandry shall be more completely centered in one grand national association.

There are other ways in which your association has contributed to the cheese interest of the country, which it might be interesting to pass in review, but there are other points which I wish to present for your consideration to-day, and I must pass on. I will close this part of my remarks by expressing my conviction that a large amount of useful knowledge relating to the art of cheese-making, has been developed and conveyed through the agency of this association to the dairy-men of the country, that is now enjoyed and utilized by them which, without that agency, would not only never have reached them, but would have been left for some future generation to disclose and publish.

From whatever cause produced, American cheese has been rapidly raised from a depressed to an elevated reputation, and the improved condition has been made to contribute to the welfare of producers. It has enabled them to dispose of their surplus goods not only, but it has allowed a large expansion without so glutting the market as to depress prices below a profitable trade. From the sudden expansion of the

export trade, and the brief period of its existence, and the fact, generally recognized, that the price of the whole American product is controlled by the English demand, has, all along, raised a feeling of insecurity in regard to the permanency of the cheese interest that is not yet obliterated. Can we depend on a uniform trade with the English that will always relieve us of our surplus cheese? is a question which is still agitating the minds of many dairymen. I will answer this question by saying, probably not. Change is stamped upon the face of all things. There is nothing permanent but the laws of nature. They alone continue uniform forever. I know of no reason why the dairy interest should be exempt from the rule. War may vary our relations with the English. The vicissitudes of the seasons may cut off our supply and the English trade run into some other channel and be taken away from us; some other people may supply them cheaper; or we may not care to sell cheese to them forever. We are a very changeable and progressive people. We may not be to-morrow what we are to-day, nor our wants of to-morrow those of to-day. We move with tremendous strides and energy. A large city may be burned in a day, and be rebuilt so soon that its absence is hardly noticed. A territory equivalent to a whole State, is transferred from forest and prairie to cultivated fields, and peopled in a single year. With the rapid and vast mutations that are going on around us, can you expect that our condition as dairymen will remain always the same. Notwithstanding the vastness of the dairy interest, and almost astonishing progress in the quality of its goods, the work of manufacturing dairy products, even in its present improved condition, is very imperfect and in some respects wasteful. It is but a temporary economy and very unlike the results of other manufacturing. The man who spins and weaves the fibers of wool and cotton, adds the value of his labor to the value of the raw material, and his goods go to the consumer with this increased value, who is but too glad to pay for what has been added at a cost much less than he could have added it himself. So the man who grinds our grain and smelts our ores increases the value of his raw material by the value of the labor he has added to it. Not so in the manufacture of dairy products. Milk, by being manufactured into cheese, acquires no additional value as food. It is even less by one-tenth that is left in the whey. Nor has it any higher commercial value, for if the milk of which it was made were placed in the same market with the cheese it would bring a greater amount of money.

The dairyman gives two-fifths, or 40 per cent., of his raw material for manufacturing, and pockets a loss of 10 per cent., making 50 per cent. in all, which he gives, not for increasing its inherent value, but simply for the sake of diminishing its bulk and prolonging its keeping qualities. The loss of food in converting milk into cheese is not, to be sure, of much account, as it is mostly of the kind called carbohy-

drates, and is cheaply supplied in other food in which it is in excess. But in converting milk into butter the process is wasteful in the extreme. Very nearly all that is valuable as a means of sustaining life is cast away. All the cheesy or flesh forming material in the milk, which constitutes its intrinsic value as food, is essentially lost as a means of sustaining human life. The present process of butter-making is too wasteful of human food to be long tolerated where economy is required to obtain the means of subsistence, or where the means of sustaining life have any considerable value.

To use milk only for making butter in the way it is now generally done, is just as wasteful as it would be to slaughter a fat ox, and strip from his sides so much of the fat as could be readily separated, and then to throw in the carcass to the pigs. You may think this an extravagant comparison, but I appeal to the considerate reflection of you all for its justness. We object to converting grain into alcohol because of the attendant waste of food. I will not compare butter with alcohol, but in its manufacture is the waste any less? Milk is not only the best animal food, but is very much cheaper than meat. It contains, as an average, 13 per cent of solid nutriment and meat 26. Two pounds of milk, or one quart, is equal to a pound of lean meat. A quart of milk can be produced and sold at less than half the cost of a pound of meat. It is, therefore, the cheaper. Its equal healthfulness will hardly be questioned. That it is perfectly adapted to the use of infants and children is a fact too well established to need any confirmation, and when it has been deprived of a part of its water, *i. e.*, condensed, it is equally good for adults. This is now done on a large scale, at a small cost, and the only obstacle in the way of bringing condensed milk into general use as a substitute for butter and cheese and other animal food, is the great cost of apparatus for doing it. That the perishable nature of milk can be counteracted, and a part of its water evaporated on a scale commensurate with the capacity of factories and dairies, is possible and even probable, and hence I point you to the use of condensed milk as likely in the future to modify our export trade and the cheese interest not only, but the whole business of dairy husbandry.

I see nothing in the immediate future to indicate any sudden change in our exports, and yet I do not think the probabilities of holding an unvaried continuance of the British trade as good as they were a year ago.

The question of our ability to compete with English skill in satisfying English taste, I consider settled. Nor is there anything unusual to be anticipated from German cheapness; and that the large extent of grass land in the north of Europe will be studded over with cheese factories and fill the markets you have learned to supply, there is no fear

at present. I anticipate that the shipping interest of the United States will meet with more formidable competition nearer home. I allude to our Canadian neighbors.

A brief sketch of the Canadian cheese interest will indicate the bearing that interest is likely to have upon our own. During the year which preceded the abrogation of the Reciprocity Treaty, which occurred in March, 1866, our bill against Canada for cheese was, in round numbers, \$200,000, which represented something like one and a half million pounds of cheese. The almost prohibitory tariff which was then laid upon that luxury, compelled the Canadians to rely upon supplying themselves with their own make. They started on the associated plan, which proved there, as well as in the States, a perfect success, and there has been built up from that beginning, in the short space of six years, an interest that has grown into an important branch of commerce. I have not the figures to show the rate of progress any further back than 1869, in which year I find them supplying their own necessities and exporting to the mother country 5,827,782 pounds—almost six millions. This is progressing with an impulse that indicates American blood.

The next year, 1870, ending June 30, 1871, they added 2,443,657 pounds more, making a total export that year of 8,217,439 pounds. I have not the figures for the year ending June, 1872, but in my visits to Canada last winter and spring I found that the best informed shippers estimated the increase of that year from five to eight millions. The lowest estimate for that year would make a total of thirteen and a quarter millions. With a laudable animation and zeal, extensive preparations, I learned, were everywhere being pushed with a view to a still greater increase during the season just past. I do not, of course, know precisely, but I think it fairly probable, that their fiscal year, which will end with June, 1873, will show that instead of purchasing from us, as formerly, from one to two millions, they have taken the place of our exports to the extent of 20,000,000 of pounds. Whether this estimate is too large or too small, the fact must be apparent that Canadian cheese must before very long seriously affect our trade in the English market. They learned to make cheese of us, and they make it after our pattern. They have not yet attained to the excellence of our dairying districts, but there is enough of the American element among them to perfect the art by and by. They have a vast extent of country, with a soil favorable for the production of the best grasses, and well watered, and with a climate suited to cheese-making, and last, but not least, both land and labor are cheaper with them than with us. They have the elements for producing excellent cheese at a less cost than we can, and when the price of our exports shall be reduced to the bare cost of production, our Canadian friends will be able to sell at the same price and have a margin left for profit. The cir-

cumstances which surround the Canadian cheese interest are suggestive, and, like coming events, cast their shadows before. But that interest is already affecting us. A place for twenty millions in addition to our present exports would have a stirring effect upon prices.

The cheese interest rises or falls with the price cheese can be sold for; and, as with everything else, that price is controlled by the relations of supply and demand. Enlarging the demand makes trade brisk, and prices high, and prosperity to dairymen follows. Without attempting or desiring to depreciate the value of our exports in the past, or the present, I think the question may here be fairly raised whether catering to a foreign instead of a home market is now the most efficient way of creating a demand.

The propriety of cultivating a home market has been often and ably discussed, and I shall perhaps appear stale in noticing it to-day. But there are some considerations connected with the course dairymen are pursuing with regard to home and foreign markets, that I must ask your indulgence for calling up at this time.

The home trade affords a much larger field for operating in than the foreign one, the latter being almost entirely confined to England, and a small per cent gain in the former might easily be supposed to produce a larger result than in the latter. But it may be asked, why not cultivate both? I answer because it is written, "no man can serve two masters." To maintain a good reputation in the English market it is necessary to send our finest goods there, and to keep the poorer class for ourselves. Most of the poor cheese will neither bear nor pay transportation. The effect of this is to depress the standard of cheese in our own markets, to diminish consumption and lower prices. To make cheese for the English market is to unsuit it for our own. Its maturity is so much hastened in its passage across the ocean, that to prevent it from becoming over-ripe before it reaches its destination, it must be made firmer and dryer than our own people desire it. If the practice of making this style of cheese was confined to what is actually shipped, there would be less cause for objection. But most of the factory cheese, including what remains at home, being made with the supposition that it will be shipped, is made too dry and hard for home use.

So long as we continue to send out of the country so much of the best cheese, both factory and dairy, the home market will be comparatively inactive and cheese-eating in little favor. This state of things is incident to a large shipping trade. It is not peculiar to us. The Canadians are in a similar situation and even worse. They ship their choice cheese even closer than we do, and leave little else than the very dregs for home use.

I have spent most of the past year in the city of Rochester, and have

looked somewhat after the condition of cheese in that market. It has been very difficult to find such as I could call either palatable or wholesome. What is true of Rochester I suppose is true of most other cities in the Union. But very little cheese is offered which is either inviting or satisfactory.

I do not say this to make out a strong case. I speak of the trade just as I see it and just as consumers speak of it. I only declare to you the opinion they entertain, and I speak thus plainly in regard to it because I consider it is exerting a tremendous influence for evil to the cheese interest of the country. Having thus called attention to it, I have, perhaps, said all I ought to say on the subject. But this state of things is exerting indirectly an influence in another way. The opinion which has to some extent prevailed that cheese, even in its best estate, was unhealthy and must be used sparingly, has, from the frequent occurrence of poison cheese and from the faulty condition of the cheese in our markets, swelled almost to a universal conviction.

When I wrote the essay in which I endeavored to demonstrate that cheese was wholesome as well as economical, I felt strongly the necessity of replying to this charge which I then knew lay heavily against it.

It seemed appropriate that a more full statement of the sanitary effects of cheese should accompany that paper. But being admonished that brevity was desirable, it was omitted, with the hope that some other pen would take up the subject. I am not aware that there has yet appeared any clear or full statement of its hygienic effects. As it is important that consumers should know its true relations to health, and that you, as cheese producers and makers, should be familiar with all that pertains to the goods you offer the public, I will, with your permission, state my convictions on the subject.

Besides the occurrence of poison cheese and certain varieties that seem to be allied to it, there is a pretty common belief that the use of cheese tends to constipate the action of the liver and bowels, and hence disturbs the general health.

That the effects, as stated, follow the use of cheese I am not disposed to deny. I am not bold enough to dispute or question the experience of a whole community.

But I may, without presumption or arrogance, question a conclusion drawn from that experience. The fact that all the cheese used by an individual or a community, may have been followed by certain effects, is not conclusive that all cheese would be followed by the same effects, and this is what I shall attempt to show.

Before going further let me call your attention to the nature of the changes which occur in the manufacture and curing of cheese. I have

stated to this Association on former occasions, and I will remind you again now, that the changes which occur in converting milk into cheese, are of a digestive character and are produced by the use of the gastric yeast applied to the milk, under the name of rennet. From the use of this agent certain changes uniformly occur in the cheesy matter as it passes from its liquid state in the milk to the solid pressed curd, and then to its soft, salvy condition in mature cheese. These changes are regular in their course, developing certain products at each stage, and varying the condition of the casein all the way along. The first new product is the whey; then the development of lactic acid and then a little vinegar; then the changes assume a putrefactive character, and ammoniacal gases are evolved, followed by soluble substances that resemble gum, and an oil to which is ascribed the peculiar flavor of cheese, and finally the casein begins to degenerate into several fatty matters, and the whole mass becomes salvy, rich and soluble, and, as we call it, cured. It is the rennet which was put into the milk, and which was inclosed in the curd, that has occasioned all these changes, and which has itself varied with the varying condition of the mass in which it was contained. I wish you to mark the fact that the casein does not become soluble till the latter stages of maturity, and that not till then does it take on its fatty appearance.

Curd, so long as it remains such, is soluble only by the aid of some alkali. It does not, as you know, dissolve in water, nor in acid whey. If taken into the stomach, it is neither digested nor dissolved till it is changed, or meets with an alkaline liquid. And here you may see the indigestibility charged upon cheese. It is not a quality that is inherent in the cheese, but is one which attaches only to its curdy state. American cheese-makers have brought their cheese into disrepute with our people, and subjected it to the disreputable name of indigestible, by thrusting it upon the market before it is properly cured. A very large percentage of cheese we find on sale is little less than half dried curd. It is not cheese in the proper sense of that term.

It is doubly unfortunate to offer such green curdy stuff to American people. They are notoriously a nation of dyspeptics, and a more unfit class of consumers could not be found to cope with such indigestible matter. It could hardly do otherwise than to disturb the stomach and the general health, and to produce disturbance mentally and morally as well as physically. I should, from *a priori* reasoning, consider it a matter of prudence to keep a respectful distance from a dyspeptic with a meal of green cheese in his stomach.

It would be very natural to suppose that the tendency to constipation complained of in cheese would follow from such difficult digestion, and it may have something to do with it, but I think it is not the principal cause. Rennet in its natural state, or as used in cheese-making, has, if taken alone, just the constricting tendency of green

cheese. It is taken up in the curd in an unaltered condition, and if carried into the stomach must produce its specific effect. Fortunately it does not always retain that action, for, as I have before stated, it changes as the curing process goes on, a fact which is in perfect accordance with the usual behavior of ferments. The same yeast that produces lactic acid changes that acid into alcohol, and the alcohol into vinegar, and, in each of these changes, is itself changed, and assumes a new form. Thus with the digestive yeast or rennet. When the ripening process has reached the stage in which the casein becomes broken down and soluble, and fatty matter begins to be freely formed, the rennet, without losing its vitality, is itself so changed as to lose entirely its constricting tendency, and becomes laxative instead.

Cheese needs to pass through a period of ripening the same as fruit, and for a somewhat similar reason. Green cheese is no more fit to eat than green fruit. But when it has, like fruit, reached a proper stage of ripeness, it is as easy of digestion and as wholesome, and may be used as freely as any other equally concentrated food. The English generally use mature cheese, and hence can eat it as freely as other food, and with equal safety; while we, by using it green, can take but little, and often find that little too much.

An expert can distinguish the different conditions of cheese at a glance; but consumers are not generally experts. Their acquaintance with the characteristics of cheese is so slight, that but few are able to distinguish the good from the poor, and they purchase, if they buy at all, just what happens to be set before them. It is not easy to make this discrimination with words. Experience and observation must be the only true guide. The extremes of maturity and immaturity may be easy enough to define, but it would be as difficult to describe the intermediate stage as it would be to state the precise time when an apple is ripe. But I will name some of the external indications of fitness and unfitness for use. The proper stage of ripeness is characterized by a total want of elasticity when pressed with the finger. The cheese feels as if breaking under the finger, and the dent remains; has a salvy and oily appearance when mashed between the thumb and finger; and melts on the tongue, like a ripe pear, when taken into the mouth; and it retains, when cut, a soft, oily surface for a long time, not readily drying up. The opposite indications mark the unripe, indigestible cheese, viz: Elasticity when pressed; a hard or tough structure when mashed between the thumb and finger; drying and cracking readily when exposed to the air; a harsh and dry appearance in the trier, and a want of fat and disinclination to melt when masticated. It is not enough that a cheese is soft or free from objectionable flavors. It must have had its casein changed, and its tough, curd nature broken down so as to dissolve easily. Cheese that dries rapidly on being cut, may always be relied on as not having yielded up its curdy nature to the

cheesy fermentation, and is subject to the charge of difficult digestion. The water in curd is feebly retained,—most of it mechanically held in minute cavities; while in ripe cheese it enters into chemical union with the new products formed by the more complete fermentation, and contributes to the buttery appearance of ripe cheese, and hence does not evaporate away readily.

I find but little cheese among the retailers so well cured as to be free from the charges imputed to cheese generally, but which really lie only against imperfect cheese. And why is there so little? Perhaps the first reason is that dairymen are often in a hurry for returns, and push their goods off green to make quick sales. This course saves room in the factory or dairy, and care and shrinkage. The individual may gain a little by such a course, but the dairy interest loses much. But dairymen are often driven to this course, because their cheese might decay before it would be properly cured, and if, perchance, it reached the desired condition, it might not remain long enough in that stage to be disposed of to advantage.

Cheese made from milk that is tainted or otherwise imperfect, will not live to a respectable old age. There is plenty of cheese of this sort that must be disposed of prematurely to save it. This kind of cheese is very much in the situation of a certain farmer's hogs last fall. The owner had made up his mind to keep them till New Year's, because he thought they would not be fit for market sooner; but, to the surprise of his neighbors, he was seen making hasty preparations to kill them in November. When asked the cause of this sudden change in his determination, he replied with much earnestness, "They have got the epizootic, and I have got to kill them to save them." It is very much so with cheese made in the hot part of the season from milk that is tainted or so faulty as to incline the curds to float. It has got the seeds of destruction in it, and the dairyman has got to get rid of it, or it will spoil on his hands. American cheese generally is too short lived. It does not give the producer a sufficient latitude to dispose of it to the best advantage. It must go to the consumer within a comparatively short time, for its perishable nature will not allow it to remain. This is a great misfortune to the cheese interest. It stagnates the markets and drags down the reputation of, and casts a suspicion upon, all cheese. There is no necessity for this short lived tendency. Milk that comes from healthy cows, that have been fed upon wholesome food, have had pure water to drink, and pure air to breathe, will, if properly handled, and manufactured with a fair degree of skill, make cheese that will keep one, two or even three years with perfect safety. This is not a difficult thing at all, if only the circumstances connected with the production and management of the milk are properly attended to. The Swiss are notorious for making such goods. You may say that the sweet feed upon the Alps, and the pure breezes that fan the moun-

tain pastures, and the crystal waters that ripple down their slopes, give them advantages over dairymen on lower lands. That may be so. But the people of England, in the low moist climate of that island do the same thing. I have seen English cheese, as doubtless many of you have, two years old that was right in its prime. I dare say there are manufacturers in this room who have made cheese that would hold out good for two or three years. Samples of this kind are often on exhibition at our agricultural fairs. But such cheese can't be made of tainted milk nor milk in which the inclination to tainting has been started.

What has been done can be done again, and it seems very desirable to repeat these examples of perfection in the details of milk production, and handling, and manufacturing, which, while they insure long keeping, insure also purity of flavor, and healthfulness, and remunerative prices.

Our cheese is not only too short lived, but with all the improvements yet made, it is largely imperfect in flavor.

The flavor of cheese seems not to have been looked after as much as some other features. Perhaps one reason for this is the fact that buyers have looked more to texture than to taste. And the towering advantage derived from bringing large masses of milk together to be benefited by the skill of one man, and the great saving of labor and expense in manufacturing and curing, and in giving a uniform appearance and quality to cheese, seem to have satisfied dairymen, and they have not given the consideration which is due to some practices that affect the keeping and flavor of cheese, and they have been allowed to remain. I will notice a few particulars of this kind.

The present practices of dairymen in handling and carrying milk to factories, are of this sort. They promote a tendency to decay in milk before the rennet is applied, giving the germs of putrefactive fermentation the start of the action of the rennet.

That milk which is sound when the rennet is applied will make a cheese that will keep sound longer than one that was made from milk that was tainted when the rennet was applied, needs no argument to prove, and that a tendency to tainting will produce an effect proportionate to the progress made, is equally evident. That large masses of milk spoil sooner than small ones, and warm milk sooner than cold, and milk in confined air sooner than in open air, are facts well known to every dairyman, and yet they are ignored year after year by the patrons of almost every factory in the country. The milk of a dairy massed in a body, warm, and closely covered, is moved from the dairy to the factory in this condition. What more favorable circumstances could be desired to induce taint and incipient decay. I have no doubt from what I have seen by watching the practice that more progress is made in milk thus treated in one-half hour than would be made in 12

hours in milk cooled and open to the air. If taint actual and sensible is not produced, the germs of putrefactive fermentation which are always in milk will be started at once, and a tendency to taint begun, which will be sure to go on, for a taint once started never lets go its hold. All the progress it has made will be kept. Just how much advancement has been made every patron can decide for himself when he lifts the cover from his can on reaching the factory. Whatever progress has been made may be counted as so much done towards shortening the life-time of the cheese to be made from it. If perceptible taint has been produced, it will be likely to spoil the cheese before the curing process can be completed. If it is less, the cheese will last longer, but at any rate, will fall some ways short of lasting as long as cheese from sound milk. All this, it would seem, is so plain that the way-faring patron could not help seeing it. But somehow the practice goes on and is almost universal. I know it can be said that the hot weather, and the food and drink and air of which the cow partakes and her treatment all conspire to the unfortunate result, and that is undoubtedly so. But notwithstanding that, there is but very little milk that is so unsound when it comes from the cow that it will not make excellent cheese if it is at once properly aired and cooled, and allowed free access to the air on its way to the factory. Milk as it comes from the cow is never, perhaps, in its best condition for making cheese. It needs to be improved by airing at least. But the present practice of dairymen makes it worse instead of better, for the milk which appears sound at the dairy, appears unsound at the factory.

The injury resulting from the practice alluded to is not confined to enhancing the perishable nature of cheese. It injures the flavor as much. There are numerous agencies in milk of a putrefactive character of which the basis of "animal odor" is but one. Whatever will develop one will develop all. If the cultivation they have received at the hands of the dairyman does not set them so far ahead of the rennet as to keep them in advance of it, they will at least act with it, and modify the flavor of the cheese, and every such modification produces an unfavorable effect. The purest flavor and best keeping qualities are obtained when the rennet acts alone without any modifying influence. Clean flavor and long keeping are correlative qualities and go together. The presence of one is an evidence of the other. All the strong or offensive flavors that attach to cheese, of whatever name or nature, are of a putrefactive character and injure keeping as well as taste. And it requires but a slight putrefactive agency to render the only matter in milk or cheese rancid, and a further injury to flavor and healthfulness follow. When you consider in all its bearings the treatment milk is accustomed to receive before it reaches the factory,

I think you will agree with me that it is pregnant with evil and that it is a serious obstacle in the way of improved cheese-making.

The want of pure air in factories, especially in manufacturing rooms, is another defect that has been allowed to follow the factory system. There are but few factories, that to an outsider do not smell more or less of sour or stale whey. The inmates of the factory soon become accustomed to this odor and fail to recognize it unless it is pretty strong; and hence it is not uncommon to find the air of a factory conveying emanations to an extent sufficient to affect the quality of cheese. The emanations are absorbed by the milk standing through the night in the manufacturing room and by the cheese while curing. I am not going to complain of the manufacturers for a want of common cleanliness; the fault is, perhaps more in the arrangement of factories than in the workmen. Milk ought not to stand through the night in a manufacturing room with a porous wooden floor full of seams and joints and perhaps holes that will allow whey and wash water to fall through. Neither ought the cheese while curing to be allowed the contact of odors from such a room.

It would be much better if the milk brought to the factory at night could stand in a building apart from the manufacturing room and entirely out of the reach of its odors, and be wheeled into the manufacturing room when ready for working. The cheese made of milk that has been permitted to stand where it will absorb the fumes of sour whey, is inclined to be drier and less adhesive than it otherwise would be; the process of curing is partially counteracted and retarded, and it acquires a lifeless and insipid flavor, and, if the fumes have been pretty strong, will take in a distinct odor and flavor of the stale whey.

Lest some of my hearers may think I am ascribing effects too large for the cause, I beg leave to remind you of the absorbent properties of milk, and how readily ferments take root in it and grow and multiply. It is a matter of common observation that milk standing in a cellar in which are any strong smelling vegetables, as onions, cabbages, or turnips, will invariably smell and taste of those vegetables, or of any other peculiar scent that may be in the cellar. An expert in handling butter assured me that he could unerringly distinguish by the taste and smell, the difference between butter made from milk kept above ground, and that kept in a cellar, no matter how neat that cellar might have been kept. Well authenticated cases have been published in which small-pox, typhoid fever, scarletina, measles and other infectious diseases, have been conveyed through the virus absorbed by milk which has been allowed to stand in the sick room, or been handled by parties before fully recovering from such diseases. The common souring of milk proceeds wholly from an agency it absorbs from the air. There is no air so pure but that milk will, in a few minutes, absorb from it the seeds of a ferment, that will cause it to become sour. This

may be easily proved. Take, say two quarts of milk, and heat it to the boiling point, to kill all the germs it may chance to contain, and, dividing it, seal up, while hot, each half in separate cans, just as you would canned fruit, and then let the cans stand till the milk is cooled down to 70°. Now open one of the cans and let the milk be exposed to pure air ten minutes and then seal up again as before, and let both cans stand together at a temperature of 65° or 70°. The milk in the can which has been opened will sour in 36 to 48 hours, and the other will keep just as well as any canned fruit and remain unchanged for an indefinite length of time. In the ten minutes' exposure, it must be remembered, this infection was given from pure air in which nothing could be detected. Now, if such a result can be brought about by so slight an exposure to pure air, what must be expected from milk standing in an atmosphere so loaded with infection as to be easily recognized by the olfactory nerves. Is it any wonder that the fumes of sour and stale whey should make their mark in the cheese made from milk to which they have been exposed? It would be a wonder if they did not. I wish to press upon the attention of dairymen, and especially of cheese-makers, the fact that all odorous vapors that mingle with the air of a factory, whether they come from whey and slops spilled upon the floor, or from draining under the floor, or around the factory, or from too near proximity of a hog-pen, make their impress upon the milk or cheese with which they come in contact. By mingling with the odors of the curing cheese, they may become, if not very strong, so altered and obscured as not to be easily identified, but they will nevertheless do their certain work in modifying unfavorably the characteristics of the cheese, making it undesirable and short lived.

The floors of but few factories are so perfectly constructed as not to allow whey or wash-water to soak into them or lodge in cracks and crevices, or to leak through them and to soak into the ground below, and whenever this happens it is impossible to keep the scent from rising and spreading through the factory. Such occurrences, though not universal, are so common as to have a depressing influence on the character of factory cheese.

To illustrate the difference between having pure or impure air in a factory, I will make a few extracts from the notes of two factories, taken in the fall of 1870, while visiting factories in the valley of the Mohawk. Omitting names I will designate the factories by numbers :

No. 1 was built over a small stream of pure water, three feet or more from the ground ; received its supply of milk from some of the oldest and best pastures in the watershed of the Mohawk ; floor of manufacturing room bored full of holes, through which whey and wash water fell upon the ground and run into the stream or soaked into the ground,

according as the amount was large or small ; hillocks of mold and filth accumulated on the ground under each hole in the floor ; much whey spilled, spattered and leaked from the whey shutes, sinks and presses, through holes or crevices on to the ground below ; curds skillfully handled and appeared fine, but smelled and tasted of the air in the factory ; fumes had free access to curing rooms above, which looked clean and tidy ; cheese looked nice ; bored several, all of which tasted of sour and stale whey ; in the trier appeared lifeless and curdy, and evidently not curing down well ; cheese occasioned considerable trouble and sold below par.

No. 2 was built on a dry incline, with the lower side three feet or so above the ground ; received milk from flats and gravelly soil ; floor perfectly tight, not a drop leaking through ; especial pains taken to prevent whey from being spilled or spattered on the floor ; wash-water and drippings from presses conducted away in open gutters, kept sweet by frequent scalding ; air in factory pure as out-of-door breezes ; milk and curd handled in the usual manner—almost precisely the same as in No. 1 ; curing-room in separate building, neat and ventilated ; cheese looked fine ; bored several, all fine flavored, meaty and rich, gave no trouble ; sold at top of market. It will be no disgrace to No. 2 to say that in competition with some of the best factories in Herkimer county, it took the first premium at the New York State Agricultural Fair, which I was satisfied it merited from the unusual purity of its flavor.

Nothing could be clearer to me than the different atmospheric influences of these two factories, yet the manufacturers in No. 1 had not the least suspicion that their skill was being thwarted by the unnoticed fumes of sour and stale whey. The influence of such odors is insidious but powerful, and if obviated would raise the standing of many a second class factory. It operates to an extent, though little suspected, so wide as to affect the national reputation, and needs the watchful attention especially of cheese-makers.

In glancing at some of the leading circumstances that affect the cheese interest, the defects in curing and in the quality of rennet, as well as some other items, deserve consideration, but I have detained you too long already and I shall pass them by. I will remark in regard to rennet that there is a possibility that it may be dispensed with and electricity used in its stead. Professors well acquainted with the science of electricity assure me that milk may be coagulated even more rapidly by it than by rennet, and a cheese-maker, who claims to have used it for the purpose of cheese manufacture, informs me that he has found the curd made by it to cure into fine flavored cheese. He reports it as having extraordinary efficiency in reducing the curd of skim milk into salvy, rich appearing cheese, but it did not restore the flavor that was

lost by the removal of the cream. It was said to have just the flavor which the milk in its skimmed or unskimmed condition would produce. I have no experience of my own to verify these assurances. The matter is now undergoing a thoroughly scientific investigation, and if the coagulation proves as stated, it will be put to practical tests at the opening of the season and the result reported to the next convention. It was not my purpose to say anything to go before the public on this subject, until it had been tested, lest I might give rise to expectations that would never be realized, but from the allusions made to it in the Secretary's circular, I have deemed this notice appropriate.

I most earnestly hope that good may come out of it, for the odoriferous matter that goes with the rennet into the cheese has a distinct influence in modifying flavor and longevity. All that gives odor to rennet is a modified concentration of animal matter and odor very putrifying in its influence, and entirely extraneous to and unnecessary for the action of the little giant that is so efficient in the soaking of the stomach.

The active agent in rennet, when separated from its disgusting accompaniments, is entirely tasteless and inodorous, and adds no peculiar flavor to the cheese, nor does it produce any cavities or huffing or any sort of porosity in the cheese while curing. All that kind of effect comes from some kind of ferment outside of rennet.

The remedies for the defects which follow in the wake of the factory system, for the most part, suggest themselves or have already been discussed by the convention. For the injury now done to milk before it reaches the cheese-maker, airing and cooling at the dairy, and on its way to the factory, and the continued application of these means by the manufacturers, are the efficient remedy. Airing and cooling should go together. Neither is sufficiently effective alone. Cooling stops no tendency to putrefaction and kills none of the germs that produce change in milk, for the moment the temperature is raised to a favorable pitch they spring into vigorous activity like vegetation in the spring. But it retards their progress, and this is important. Air absorbs away the filthy odors, and kills all the growing germs it touches. It kills no undeveloped spores or seeds. Until germination takes place they may float on the air with perfect impunity; but the moment they begin to grow, the contact of oxygen puts them *hors du combat* instantly. In all the means now before the public for airing milk, the air that goes into it is itself loaded with seeds that are pregnant with change and decay. The office which the air performs, besides cooling and carrying off odors, is to kill off the growing crops of germs in the milk, and plant in their place a more slowly growing variety, and thus gain time for the cheese-maker to forestall their action by the seeds of coagulation. It would be much better if the air which was to come in

contact with the milk could be deprived of the millions of germs it contains, so as to prevent this reeceeding of the milk, but as yet no means are before the public for doing it. I have been informed, however, since I came here, that a gentleman well known to many of you for his unusual aptitude in mechanics and invention, Mr. Stewart Perry, of Newport, N. Y., has devised a simple and inexpensive method of doing this. It is simply causing the air that is forced into the milk to pass through gun cotton, cotton wool or some similar fine fibrous substance, which catches and filters out every seed of infection. Pasteur did this most effectually on a small scale, and if the plan proposed shall be found effectual on a larger scale, and it certainly appears feasible, it may prove a valuable discovery for the dairyman. But taking the air as it is, without any unusual infection, it is a most valuable and efficient means for improving the condition of milk for cheese-making.

The means of improving the atmosphere will occur to the owners of factories and the cheese-makers. I have said all I have need to in pointing out its effects.

And in regard to rennet, I will only say that so long as its use must be continued, or until some future genius shall rise up and make an inodorous extract holding the active agent in solution, the objectionable features of the steepings may be very nearly wiped out by putting a bag of charcoal in the jar and weighting it so it will sink.

In this hasty survey of the cheese interest, I do not wish you to draw the inference that I have dwelt upon some of its attendant defects from choice, or because I see none of its better features. Defects must be pointed out and be seen to be corrected. While I am grieved and ashamed of the very large defects in flavor and quality which attach to much of our cheese, especially of that which falls into some of our home markets, and of the unhealthful condition in which it is offered, lowering its reputation and restricting its use, I am not insensible to the high reputation which American dairymen have earned for themselves. That we supply a million and a half per week to the most fastidious cheese eaters on the globe, who themselves boast of their time-honored skill, and acknowledge that we satisfy their taste and crowd their own goods out of market, is an achievement of which any dairyman may feel proud. Every dairying country has its excellencies and defects, and of course we must share with the rest. The Swiss can boast of an Alpine luxury. The French have their Gruyere and their Roquefort. The English rejoice in their Cheddar and Stilton. And we have our Herkimer county, a full match for the best of them.

TRANSACTIONS

AT THE

EIGHTH ANNUAL CONVENTION

OF THE

AMERICAN DAIRYMEN'S ASSOCIATION,

HELD IN THE COURT HOUSE, UTICA, N. Y.,

TUESDAY, WEDNESDAY AND THURSDAY,

January 14th, 15th and 16th, 1873.

At fifteen minutes past eleven o'clock, the convention was called to order by the President, Hon. Horatio Seymour, of Utica, N. Y.

Mr. J. V. H. Scoville, of Oneida, moved that the chair be empowered to appoint the usual committees. Carried.

The following committees were then announced :

ORDER OF BUSINESS.

Messrs. Scoville, of Oneida county ; Bliss, of Vermont ; Bonfoy, of Herkimer ; and Barnham, of Chautauqua.

NOMINATIONS.

S. A. Farrington, of Yates ; C. C. House, of Lewis ; W. A. Johnson, of Erie ; L. T. Hawley, of Onondaga ; and D. H. Burrell, of Herkimer.

FINANCE.

William Blanding, of Broome ; Edward Emerson, of Erie ; and E. R. Hopson, of Herkimer.

DAIRY UTENSILS ON EXHIBITION AT THE CONVENTION.

Gen. B. F. Bruce, of Madison; L. L. Wright, of Oneida; S. T. Miller, of Lewis; A. Wheaton, of Vermont; and H. C. Greeve, of Pennsylvania.

It was suggested that the committee on order of business meet immediately. Suggestion adopted.

The convention then adjourned to 2 P. M.

AFTERNOON SESSION.

The convention assembled, as per adjournment, at half-past two o'clock. The attendance was considerably larger than on the same day last year.

The first business in order was the report of the committee on order of business for the convention, by the chairman, J. V. H. Scoville, of Oneida, who presented the following report:

The committee for the arrangement of the order of business would respectfully report the following as the programme for each day, to be followed as nearly as circumstances will permit, it being understood that following each paper ample time will be given for discussion.

TUESDAY AFTERNOON.

A paper by Governor Seymour on "The use of the microscope as a farm tool."

A paper by B. B. Moon, Esq., on "The effect of varied manipulations on the quality of cheese."

TUESDAY EVENING.

The Secretary of the Association, on "Lessons drawn from three years' experience in conducting a creamery."

WEDNESDAY MORNING.

David W. Lewis, of New York, on "Marketing Dairy Products."

Hon. Harris Lewis—subject not named.

Report of standing committees.

WEDNESDAY AFTERNOON.

The annual address by L. B. Arnold, of Rochester.

Paper by X. A. Willard.

Paper by O. S. Bliss, Secretary of Vermont Dairymen's Association, on "The butter factory system of Northern New York," to be followed by a general discussion of butter making.

WEDNESDAY EVENING.

Sociable.

THURSDAY MORNING.

Report of special committees.

William Blanding, of Broome county, on "The benefits of skimming the night's milk."

T. D. Curtis, of the *Utica Herald*—subject not announced.

S. A. Farrington, of Yates, on "Making and marketing cheese."

THURSDAY AFTERNOON.

Will be specially devoted to the consideration of subjects connected with practical cheese-making, by way of informal discussion. The committee feel justified in stating that several papers in addition to the papers above mentioned, may be expected from time to time during the convention. All of which is respectfully submitted.

J. V. H. SCOVILLE,
O. S. BLISS,
A. BURNHAM,
SETH BONFOY.

Report accepted and adopted.

The President, Hon. Horatio Seymour, of Utica, then addressed the convention upon the

USE OF THE MICROSCOPE IN TESTING MILK, CREAM, CHEESE, &C., AND
AS A FARM TOOL.

Human sight is dull and weak. Out of the many objects and movements around us, we see but few. The air and water are filled with animal and vegetable organizations invisible to us. Plants change and grow under our eyes, but we do not see the process. Even large objects are viewed in mere outlines; we do not, with our feeble visions, learn their texture and real nature. It does not teach us the character of our own bodies. We know nothing of the structure of the skin upon our hands, or the hair upon our heads, until they are shown to us by artificial helps. In truth we live in a dim twilight on the outer edge as it were of the swarming active life which fills the earth, but which we cannot detect with our unaided senses.

What we do not see, not only exceeds many thousand fold what our vision shows us, but invisible things are the most active agents in the work going on in the world around us. The rocks waste away, the mountains are melted down, the seas are filled up, mineral matter is changed into vegetable growth, the great changes in our earth in the past and which are still going on, are wrought out by causes so minute that we do not discern them, although the work is done in our presence. The pestilences which carry death into our homes are frequently caused by minute animal or vegetable organizations which enter our dwellings in the clear light of day, but we do not perceive them, and we wonder why our friends sicken and die. On the other hand the farmer gets the reward for his toil by the help of nature, which works in secret ways, showing results in full harvests, made by processes which are all dark to us. If we study out the numbers of things we cannot see and their importance to our health and happiness, we find that with few exceptions we are groping in the dark.

I do not doubt that this is wisely ordered, and that it is in the main for man's well-being when we take into account the fact that he is gifted with facilities which enable him, in a good degree, to overcome the evils of feeble vision. The work of keeping our senses is one which gives happiness, which trains and strengthens our minds and which elevates us into a moral and intellectual dignity and worth. If our eyes were microscopic he would see too much for mental or moral strength. Enough is done for us when we are put in the way of finding out matter for ourselves, and, when above all, we are endowed

with the power which enables us to enlarge the scope of our mental and physical action. To let these talents lie buried is a crime against the laws of our being.

To none of the other senses have art and science given such aids as they have to sight. Magnifying glasses have been brought to a high degree of perfection. The most powerful, which are called microscopes, will magnify many thousand times. They show animals living in air and water, which to the natural eye is free and clear from any object, and they also show that their myriads of existences are of the most varied character, and have laws of life not only unlike, but positively at variance with those with which we are familiar. By the aid of the microscope we have found out a great many of nature's secrets, and we are in the way of learning many more. We also begin to use her processes. We turn them to account in the arts and sciences, so that we get not only mental pleasure, but we also make business gains. Of still greater importance to us is its use in studying the laws of human life. Physic and surgery have made great strides with its aid. It is used in most workshops and factories. It has become a great practical instrument, giving power to one of the most valuable of our senses; and those who use it have a great advantage over those who do not.

My object now is to show that the microscope must be made a "farm tool;" that it is a practical working machine and will pay as well as other tools; that it will help the farm as much and the farmer more than any other labor-saving machine; that it will give a new value to every other implement and will lead to many inventions of use to him.

In the first place I will speak of its value to that class of farmers who make cheese. We have had interesting addresses from men of science upon many things connected with this branch of business. They have given interest, value and dignity to the proceedings of this association. Our reports have been sought for from all parts of our own country and Canada, and many have been sent to Europe. You will bear in mind that most of these addresses have been based upon facts learned by the aid of the microscope. We have been told of things of great importance about matters under our own eyes which we did not see, because our eyes had not the power to show them to us. We have learned great truths from other men about our business, because they used a tool we did not keep. What they saw they told us about, and we learned as men can learn from descriptions. But why should we not see for ourselves? Words can only give hazy ideas. An address cannot meet all questions coming up in our minds. Hearing once, is not like seeing many times. Listening does not stamp things upon our mind like looking. The mind of the scientific man does not move on the same level or run in the same grooves that ours do; and it is, therefore, hard to keep the thread of his discourse. Why should we not use our own senses and know accurately, rather than use another man's senses and learn from him inaccurately? What stands in the way of this? Not the cost of the implement that ranges from fifty cents to fifty dollars; from the price of a dozen cigars up to the average bet on a horse race at a county fair. The cheapest will not show much, but they will expose any want of cleanliness in a milk can, and will give a new view of many objects. It will learn men to look and reason and in the end lead them to use better

instruments, and to engage in more elaborate researches. The more costly microscopes need some skill and care in their use. A little time and practice will make this easy. All the reading and study connected with them can be carried out in a few winter evenings. There is some trouble at first with high powers, but the eye and the hand will soon get trained.

Under our system of making cheese in factories we look to their managers for all the skill they can gain. We also expect that they will give their patrons such facts as they need to do their part in making a good article for market. They come short of their duty if they fail in either of these two respects. This association meets to promote these objects. In listening to its debates I am struck with the fact that all agree upon certain points, but all complain year after year that admitted evils are not cured. For instance, all say there must be cleanliness in milking and in cans. All have a common interest in this. All mean to live up to its requirements, but the evil continues. Why is this? Is it not due to the fact that each man has his own idea of cleanliness and each lives up to his own standard? If one of them is charged with uncleanness he feels deeply wounded and bitter angry strife is engendered. What cleanliness is, is a matter of opinion. Now apply the microscope to the can or to some minute deposit in its crevices. It shows to the eye that it has the germs of animal or vegetable growth, which will increase and multiply with wonderful rapidity through a great mass of milk with which it comes in contact. That puts an end to the trouble. The man finds out he is wrong in a way that does not touch his pride. The cheese-maker does not find it necessary to say an unkind thing. On the contrary, he can excuse the fault, if it is not kept up. If it is, after making it clear to his eyes, then cut off all dealing with him.

Much has been said in our debates about aerating milk, but little is done to carry out the practice. Is not this due to the fact that the need of this aeration is not made clear to the mind of farmers? But show them the tendency of milk to catch from other substances or to engender in itself fungus plants and infusoria, let them see through a microscope how swiftly they spread, and what corruption they can work through a large vat from a small quantity of infected milk then show to their eyes that pure air passing through the milk, will, in a good degree, kill these poisonous growths and they get a clear, distinct idea of the value of aeration. Their own senses show them that air mixed with milk does not merely cool it, but that it is death to the germs of many corruptions. For this reason many foul things cannot live in running water which fill up stagnant pools with unhealthy animal and vegetable lives. After that, when he forces air through his milk he sees that he is killing reptiles. Men can never be converted from evil ways until they get clear ideas of wrong-doing. It is hard to carry out a shadowy indefinite idea; it is hard to resist one that is clear, strong and clean cut. A good microscope in each cheese factory in the hands of one who could use it and who would collect objects for the patrons to look at, would in an easy, cheap way, work out most of the reforms at which we aim on the part of our farmers. We should see with the instrument how our cows take into their system swarms of animal and vegetable corruptions when they drink from stagnant pools. We should see the germs of poisonous life floating in the air from decaying animal and vegetable matter. We should know

what killed not only our stock but our families. The word uncleanness would mean something to us, and we should bear its import in mind.

Let us go inside the factory. He who undertakes for a price to work up the milk of a neighborhood is bound in good faith to do so in the most skillful way. It is his duty to learn all he can about the business, and he has no right to neglect or reject anything which will increase his power to do the best work. If the microscope will show to his eyes facts which he and others should know, then he ought to have one and he should learn to use it. Now we know it will do all these things. At our last meeting, Mr. Arnold, in a very able and interesting address, proved by the aid of this instrument what made poisonous cheese. He had drawings of objects so that all was made clear to our sight, and thus made clear to our minds. Our vision stamped the facts upon our minds. If he had not used his glass he would not have found out those facts. If he keeps on with its use he will find out many other valuable facts and he will teach them to others. Now any other man can do the same thing, and any cheese-maker ought to follow his example. If there were a thousand microscopes at work in our factories we should not be left groping in the dark about the causes of all the troubles in cheese-making. I do not say they would be seen at once, but a thousand visions intensified by art—a thousand minds made clear and penetrating by thought and investigation, would in a little time give us a skill which would command the markets of the world.

I said the microscope should be a farm tool. As cheese-making is a branch of farming, it will not be out of place to say something of the use of this instrument to agriculture generally. It is strange, that while it is used in almost every other industry, that it is so little thought of by those who live in the midst of those objects, and who labor upon those substances upon which it throws the most light. It shows the structure of the plants he raises, the character of their enemies, the nature of rust and blight, the habits of the insects which destroy the fruits of his toil. There is not a thing about a farm which a man will not understand better if he looks at it with a vision magnified a hundred fold. It is a liberal education which any one will get who will carry a magnifying glass in his vest pocket, which he will use on any subject that comes in his way. It will give him a new view of the world. His farm will become a museum of wonders. Everything we understand gives us pleasure. No one has studied out with a glass the peculiar structure of any tree that he did not feel a sense of pleasure ever after in looking at it. It needs more sense to live on a farm than to live in a town. Farmers are a good part of the time alone by themselves. When a man is alone with himself he should try to be with an intelligent person of good morals and a cheerful disposition. And he will have all these if he gets that acquaintance with all the animal, vegetable and mineral world around him, which he can gain by the use of his vision when it is so strengthened by art that he can look into so many of the secrets of nature. In most cases it is the empty head which leads a man to leave the country for city life.

Insects, rusts and blights are great enemies to farmers. They are mostly too minute to be clearly seen by the naked eye. It is a great point gained to be able to see what your enemy is and what he is doing. We have also numerous friends in insect life who wage war upon

our enemies. We ought to know our friends and their habits, but we can only do so by the aid of magnifying glasses. The potato bug, which is working such evil at the west, is coming this way. Our fields will be swept by them unless their insect enemies shall muster their forces in time to hold them in check. We ought at least to know our allies in the fight with these foes of the farmer.

It is one of the greatest mistakes of our farmers that, as a rule, they suffer the buyer to know more about the quality and value of farm products than is known by those whose labor makes them. The buyer has tests which the farmer does not have. I notice that when the wool buyer comes round he takes out his glass and sees at a glance the structure of the article in hand, and knows more about it than he who has toiled a year in its production. The same thing is true of seeds. The magnifier is applied to pork to see if it is infested with trichina. I think it is true, as a rule, that the buyers of farm products know more about them than the producers. The man who knows the most always gets the best of a bargain. It is certain that knowledge is power in making a trade. It can be safely put down as a rule that a man who, for natural or artificial reasons, can see a hundred times as much as his neighbors, will know the marts.

Mr. Hawley, of Onondaga, offered the following resolutions :

Resolved, That the farmers of this state have a deep interest in the progress of scientific investigations in botany, entomology and geology, and this association hereby requests the Legislature of New York to continue its support of the researches now going on in these branches of useful and practical knowledge.

The convention then listened to the following paper by T. D. Curtis, of the *Utica Herald* :

THINGS TO BE THOUGHT OF.

Mr. President :—In the hurry and amid the perplexities of an arduous calling, I have loosely thrown together a few ideas under the head of "Things to be thought of," hoping they may not be wholly unentertaining, if they do not prove instructive and useful. I have before me an audience of leading and practical men—men not only anxious to progress themselves, but to impart some of their own enthusiasm to their neighbors and have them progress also. They are missionaries in the cause of agriculture, and no doubt have not only often felt tired but discouraged—for the work of the missionary is self-imposed, unremunerative, and often thankless. Very few men can make "a good thing" out of it. But, discouraging as the prospect sometimes is, I dare say few will discontinue their efforts in the good work so long as opportunity shall offer and ability to perform remains. The field is a great and important one, and the laborers are few. Hence, there is so much the more need that we should be active, persevering and hopeful.

Some idea of the extent and importance of agriculture may be derived from the fact that it gives employment, not only to one-half of our own population, but to one-half of the population of the civilized world. It is the source whence the human family—except the savage tribes—draw their subsistence, and gives support to every other occupation or calling. None of them can get along without the farmer. He feeds them all.

Yet, notwithstanding the universal extent and overshadowing importance of the interest of agriculture, it has occupied an inferior po-

sition in popular estimation, and has received less attention from legislators and statesmen than almost any other occupation. Our own government has expended millions on commerce—the child and dependent of other industries—where it has expended dollars for the benefit of agriculture. Since the foundation of the government, it has appropriated but a little over \$2,000,000 in money for the promotion of the one great interest on which its own existence depends. This sum was at first given in dribbles, from the Patent Office, and in no instance has a sum worthy of the cause of agriculture been appropriated.

In our agricultural population rests the salvation of our country. The farmers have the most permanent and lasting interest in the country of any class, and they constitute the largest. They can wield both the moral and political power necessary to make our land what they choose. But they must become more educated and active, and organize so as to make their influence felt as a power not to be overlooked or treated lightly by those having political authority. At present, they are too much like cyphers, which only give value to the digit that stands before and leads them. They are too much inclined to look down, and be content with a life of routinism and drudgery.

I have an abiding faith that this will not always be. The spirit of progress is busy with agriculture, as with other human interests. The farmers themselves are rising in the scale of intelligence. Higher modes of culture are beginning to be introduced, and a higher development of intellect is required to direct the operations of the farm. Brain work is taking the place of so much hard muscular toil. The rough places are becoming smoothed down. The wet places are drained. The barren places are made fertile. Machinery is lifting the burdens from the aching back, and accomplishing in days the work that formerly extended over weeks. Communication is opened by railroads, and distant markets are brought practically near. Intelligence travels by mail with the speed of the winds; and if this is too slow, we make the lightning our messenger, and outstrip the rays of the sun. We are standing in the morning twilight of a new era. The farmer is beginning to see, as if with a new vision. He is wakening to a new activity, holding closer intercourse with his fellow farmers, reading the agricultural papers, observing facts, studying principles, trying experiments, and catching glimpses of a better future. Agricultural societies and farmers' clubs are springing up all over the country. I hope yet to see a live farmers' club in every school district, for the discussion of all topics of interest to the farmer or the citizen; and I would have all these clubs in full communication with county and state organizations. Then if we ask for an appropriation for an experimental farm, or for any other useful purpose, we shall not be put off with the plea that money is wanted for so many other purposes, and the party exigencies are so great, that such a thing cannot be thought of. The demands of agriculture will, as they should, be the first things for legislative consideration. The farmer will then no longer be a mere cypher, but a unit of some value proportioned to his intelligence and knowledge of his rights.

I now too often see our farmers looking in the wrong direction for relief. Instead of depending on themselves, they are looking too much to others, like children to a parent or guardian. Rest assured, relief will never come from this direction. "Put not your trust in princes." they will always, as they have done, look out for themselves, instead of

for you. Do not expect miracles. Everything must come through yourselves and in accordance with fixed natural laws. Beware of beginning at the wrong end of things, if you would accomplish satisfactory results. Last year I noticed that one of our western dairymen's associations offered a prize for the best essay on working up tainted milk! Could anything be more absurd? Tainted milk is unfit for human food. It has undergone organic changes which modify its character and make it unhealthful. It is not in the power of the cheesemaker or chemist to restore it. Decay may for a time be checked, and the product from it thrown upon the market. But it will go there to soon rot, and engender disease and possibly death in the body of the unfortunate wretch who may eat it.

The proper thing was for our western friends to offer a prize for the best essay on how to prevent milk from tainting. The point is not how we can dispose of tainted milk, putrid pork, rotten eggs, and diseased animals; but how we can preserve these things and keep them fit for human food. I hope no member of this association will be carried away with the idea that it is desirable to work up tainted milk into cheese.

But how shall we keep our milk sweet and clean, and make out of it a firm, rich, nutty-flavored, long-keeping cheese? This is the question and the end to be aimed at. Your president has given you a valuable and practical paper on the use of the microscope as a farm tool. Its value no one will doubt who has ever used it. It will make the difference between him who uses it intelligently and the man who does not use it, that there is between a man with two good eyes and a blind man. It will open up to him a new world. It will show him the difference between that which is healthy and that which is diseased, and often suggest the remedy.

I had occasion last spring, through the politeness of Mr. Alexander McAdam, of Fort Plain, to have a piece of poison cheese examined with the microscope. I went first to Rev. Mr. Whitfield, who has a very good instrument and is a good microscopist. We cut the thinnest possible shaving of cheese and put it under a low power. We at once discovered it to be full of cells that were denser and appeared to be harder than the rest of the mass. These cells existed in great numbers all through the cheese, and made the shaving of cheese, as seen through the microscope, appear not unlike a piece of pin maple. I took a piece of this cheese to the Lunatic Asylum, in this city, where they have one of the finest if not the best microscope in the country. Dr. Gray sent a piece of this cheese to Dr. Hun, of Albany, for chemical analysis. The result I have not heard; but I have no doubt it ended as hundreds of other analyses have, in showing nothing remarkable. But Dr. Kempster put a piece of this cheese under his microscope. A low power brought out the pin-maple appearance of the cheese. A much higher power gave the cells the appearance of fungus developments; and in one instance, a new cell had but slightly begun to develop on the side of one of these. A day or two after, the microscope showed us two cells of about the same size, with a well-defined mark of separation. One of them had developed in the specimen after it was prepared. I had hoped to be able to present you photographs or drawings of some of these views, but Dr. Kempster could not, in connection with his manifold duties as one of the physicians of the asylum, find time to prepare them. He has now gone to take charge of an

asylum in the North-west, and the institution here is left without a thoroughly practical microscopist, though I have no doubt that the deficiency will soon be supplied by some of the scientific men in the establishment.

Among other things, Dr. Kempster showed me plates giving microscopic views of milk of different kinds and produced under different conditions. The fact was made apparent by these that the first milkings of a cow after she drops her calf can be readily detected by the microscope. The milk contains cells very like, in appearance, those that we found in the poison cheese, and we at first mistook them to be identical. These cells in the colostrum, or first milking, disappear about the fourth day from the milk of a healthy cow. But where the cow does not do well, they continue for a longer time, and have been found even on the twenty-fourth day. Until these do disappear, the milk is not fit for human food. These cells are supposed to be hard lumps of fat, are indigestible, and hence are very irritating to the stomach and intestinal canal, going through, as Dr. Kempster expressed it, "like so many shot."

The cells which we found in the cheese might not be the cause of its poisonous character. More observations are necessary to determine this fact. Possibly these cells might not be found in another piece of poisonous cheese. But every cheese which proves poisonous should be thoroughly examined with the microscope. If these cells should invariably be found present and increase in number according to the degree of poison, it would be a pretty clear demonstration that they are the cause of its virulent character. What these cells are, remains to be found out. They may belong to some of the fungoid families already known, or may be peculiar to poisonous cheese.

The difficulty that now stands in the way of the general use of the microscope by our farmers is the lack of education for the purpose, and, I fear, the lack of enterprise and energy. The adage says, "never too old to learn;" but the man who has become accustomed to "go it blindly" until middle age, is apt to be slow in opening his eyes and picking up anything new. The veriest novice can see through a microscope, if he knows how to introduce his specimen and adjust the focus of his glass, as well as the best microscopist in the world, if his eyes are as good; but how can he tell what he sees? A new world is opened to him, and he has to become familiar with every object in it. In short, he has to educate himself to use the microscope understandingly, and be able to detect healthy from unhealthy indications in every object which he examines. There are hand-books with illustrations which will afford him much assistance, but the greater part he must learn for himself, for the field is comparatively unexplored and filled with countless wonders. But if every man cannot become a thorough microscopist, he can do much with low powers, and with the assistance of a good microscopist in every neighborhood, assist in his own enlightenment and that of his fellows.

If our educational system were right, there would be no trouble about this matter; and it is for our farmers to insist that our educational system be made right. We want a more practical system of education, under which our children may grow up in a knowledge of all the natural sciences.

Notwithstanding the comparative neglect of politicians and the greed of speculators, agricultural colleges and schools are beginning to

rise throughout the land. They are doing a good work and hastening on the day when a thoroughly practical education shall be within the reach of the humblest, without money and without price. The great principle must soon be recognised that each generation owes the rising one a free education in all the practical affairs of life. The principle involved in the free common school is right, but needs a fuller application. The common school does not go far enough. It was thought by our grandfathers that education need not go beyond the country schoolmaster's three R's—Reading, Writing and Arithmetic. We, in our day, have made considerable advance on this. But we are yet far from supplying all educational needs. We must have free schools for educating our boys and girls in the chemistry and science of agriculture; in the chemistry of the kitchen, in the laws of animal and vegetable physiology, and in the requirements of health. In short, we must give them a thorough practical education in all the every-day affairs of life, permitting each to choose his or her occupation, and teaching the science, philosophy and mechanical skill belonging to that occupation. We must educate them for useful men and women.

I would not be understood as opposing what is called a classical education; but I am opposed to the premature pushing of the young mind in studies which it does not and cannot understand, and which may never be of any use. I would give the rudiments, in a bold, clear and forcible manner, and leave the mind with these impressions until the proper time in the future. In place of the usual drilling on abstract questions, I would substitute the inculcation of useful knowledge in chemistry, physiology, natural philosophy and mechanics. These studies are now entirely ignored in our common school course. Yet they are of vast importance in all departments of human industry and economy. It is popularly supposed that they are too hard for the young mind to comprehend, and those who cannot afford to go through the higher schools get no knowledge of them, if they do not pick it up in a general way in their reading. Why this course has been pursued and this impression has been made on the popular mind by those who know better, it is difficult to comprehend, unless it has been prompted by an unconscious desire to maintain a kind of educational aristocracy and keep useful knowledge away from the masses, as in the dark ages. There is nothing more interesting to the young mind, or easier for it to learn, than the leading facts in natural philosophy and science. Cannot the boy who slides down hill be taught something of the inclined plane and other mechanical powers? Can he not be taught the chemistry of the snow beneath his feet, and of the atmosphere which he breathes? Can he not learn something of the anatomy and physiology of the hands which he uses, the skin which covers him, the eyes which he sees with, and the ears which he hears with? Can he not be taught to call things by their right names? There are only 63 or 64 simple substances that enter into the chemistry of our globe. He easily learns the names of the 26 letters of the alphabet, and of his 30 or 40, or more, school-fellows. Can he not also learn the names of the 44 simple substances which combine to make the earth, the atmosphere, himself, and every object which meets his eye? Can he not learn how many of these enter into the composition of his own body, what their proportions are, and that they must all be contained in the food he eats or the air he breathes? Can he not also learn something of the nature of these constituents?

In truth, there is no food so natural to the young mind as the knowledge afforded by the leading facts in the natural sciences. It finds illustrations at every turn, and sees in them explanations of what otherwise is only discouraging mystery. The knowledge acquired, leads to further inquiry, further discoveries, and further acquisitions of knowledge. There is no good reason, therefore, why the foundations of a practical scientific education may not be laid in our common schools, and the boys and girls of our farmers and mechanics taught to rightly name and understand the nature of every object with which they come in contact. In other words, there is no good reason—no reason founded in nature—why our children may not be educated and grow up in a practical knowledge of the sciences, so far as the occupation of each is concerned, making us a nation of scientific farmers and mechanics. All that is needed to accomplish so desirable an object, is a well-developed system of free education. But we shall never have such a system, until our farmers see the need and make the demand for it. Once secured, the occupation of farming will no longer stand neglected, as the lowest and least remunerative of all.

When education reaches the practical point which has been indicated, we shall put brains into farming, and mind will take the place of muscle. Everything will be done understandingly. Our boys and girls will imbibe the sciences as naturally as they now inhale the air and learn the names of the different grains and fruits, of the domestic animals, of the varieties of trees in the forest, and of the vegetables and flowers in the garden. Farming will then be attractive, calling into active use all the faculties of the mind, and demanding the widest range of knowledge of all human occupations.

We ought to have—and we shall some day have—not only experimental farms, but maps of every township, giving its geographical, topographical, geological, floral and entomological characteristics, with an ultimate and proximate chemical analysis of its minerals and vegetables; so that every farmer may know precisely what he has to work on and with, and what results he may reasonably expect. It will then be found that the fertility of the soil can be kept up much more easily than is now supposed, and with materials ready at his hand.

Air furnishes the principal amount of food for all organic bodies. A moment's reflection will show this. We see giant trees growing all around us, but they do not suck up the soil and leave a hole. The ground remains level around them, if it is not actually lifted up by the roots. Burn the tree and reduce it to ashes, and they will show you all the matter the tree contained which was not drawn from the air, directly or indirectly. Some curious experiments have been tried to prove this. I will give you one related in Downing's *Horticulturist* for 1850. He says:

Two hundred pounds of earth were dried in an oven, and afterwards put into a large earthen vessel, the earth was then moistened with rain water, and a willow tree, weighing five pounds, was placed therein. During the space of five years the earth was carefully watered with rain water, or pure water; the willow grew and flourished; and to prevent the earth being mixed with fresh earth, or dust blown into it by the winds, it was covered with a metal plate, perforated with a great number of holes, suitable for the admission of air only. After growing in the earth for five years, the willow tree was removed, and found to weigh 169 pounds and 3 ounces; the leaves which fell from the tree

every autumn were not included in the weight. The earth was then removed from the vessel, again dried in the oven, and afterwards weighed; it was discovered to have lost only about two ounces of its original weight; thus 164 pounds of lignin, or wood fiber, bark, roots, &c., were certainly produced—but from what source? Plainly from the atmosphere.

It has been found that exhausted soils are rapidly restored by plowing under clover. Why is this? You only put on the soil a few quarts of clover seed. Where does all the fertilizing material come from? If the clover draws its food from the soil, you can add nothing to it by turning under the clover. You only return what is taken away. It is like taking up a handful of dirt and throwing it down again. Where, then, do the fertilizing properties of the clover come from? They come largely from the atmosphere. Clover operates in two ways to improve the soil. It drinks in the gases of the atmosphere, feeding principally on these, which are, of course, plowed under. Then the roots of the clover are very penetrating. These run all through the surface of the soil, and often several feet down into it. These roots carry the air with them wherever they go. The air thus introduced, and that which is condensed in the stalks and leaves of the clover and plowed under, operate chemically on the ingredients in the soil, dissolving them and fitting them for plant food. Hence, when we grow clover and plow it in, or let it rot on the surface, we only call into operation the laws of nature, which have been at work ever since the earth began, and have produced all the fertilizing material on its surface. We only aid in mixing the soil and the atmosphere, and causing them to combine so as to furnish food for our crops.

There are other ways by which we can produce the same result. We can put on acids or alkalis, and fertilizers in various forms, that will act chemically on the soil, dissolving its constituents and causing it to absorb the atmosphere. Or we can pulverize the soil by plowing and harrowing, and letting in the air and the rain. This pulverizing is one of nature's principal processes. She does it by rain, and snow, and frost, and sun, and friction, and has for ages been busy in mingling earth and air in this way. So far as she has gone, she has made the surface of the earth fertile and beautiful.

There must have been a time when the face of the earth was utterly bare. The heat was so intense, that all moisture was expelled and hung around the earth in a dense cloud of steam. As the surface cooled, the cloud began to condense and cover it with water. The surface being smooth and even, there was water everywhere. But as the great ball cooled and shrunk, compressing the gases within, their pressure outward became so powerful that it caused the crust to give way in places, and rise upward and outward, making the dry land appear. The waters rushed from the elevated places, collecting to greater depths on the undisturbed portions, and by their increase of weight at those points caused them to sink in, or downward, and form the beds of the oceans. In this way, it is supposed, the oceans and the continents were formed. From that time, rain, and wind, and heat, and cold, became active in the work of softening the surface of the earth—of pulverizing and dissolving it, and mingling the atmosphere with its particles, so as to form food for plants, and through these, food for animals and for man.

Now, we can do nothing more than to imitate or assist this eternal process of nature. We can neither make nor destroy a particle of matter; but we can pulverize, triturate and dissolve it, or make it so that the rains and the air will dissolve it, and the plants will drink it up as food, and grow, and blossom, and bear fruit.

Let it be understood clearly that all food for plants or animals must be in a soluble form—so fine that it will readily dissolve—or it has no practical value. No matter how much fertilizing material you have in your soil, or may put on it, if it is not soluble, plants will not feed on it. They cannot digest it. So it is with your own dinner. No matter how nice the material may be, if it is not cooked and masticated so that it can be digested, it will do you no good. You may eat to bursting, and yet starve to death.

All other things being the same, the best masticated meal is the one that will do the most good. The best pulverized soil, other things being the same, is the one that will produce the best crops. It is the opinion of some that fertility can be kept up by pulverization alone, without one iota of manure. I have no doubt that the principle is correct, and that each locality can be made to continuously grow certain kinds of crops, to which it is naturally adapted, by simply reducing the soil to powder and letting in the rain, the air and the light. But in the great upheaval which made the continents, portions of the earth's crust were turned up edgewise, presenting to our view different layers, or deposits. In one place we find the limestone, in another the granite, in another the chalk, in another the slate, and so on. Of course each of these is different from the rest, and will not furnish the mineral food for all kinds of plants. If, therefore, we grow such as are not natural to our farms, no matter how well we prepare the soil mechanically, we must add the ingredient demanded by the plant which our soil lacks. In this is involved the whole philosophy of manuring. We should know what our soil contains and what our crop requires, and then supply what is lacking, being careful to have enough of each material in a soluble condition to furnish food for our crop.

If we have in our soil what is necessary, it is folly and waste to be putting on fertilizers, when by proper cultivation we can convert the soil into plant food. And, my friends, depend upon it, there is more in cultivation than in manuring. Turn up your soil to the light and the air, knock it to pieces and reduce it to powder. If it is a cold clay, use a subsoil plow at first; then turn up a little at a time—an inch or so—and let it freeze, and thaw, and aerate. Follow this up, and in time you can plow beam-deep and turn up a soil that will grow a paying crop. Underdraining a clay soil, putting the drains not more than 20 feet apart, will help you wonderfully—slowly, at first, but paying well in the end. Fall plowing, taking advantage of nature's process of disintegration by freezing, and thawing, and soaking in snow water, will assist you very much. Depend upon it, the pulverizing process is the true one. The little bolus of the homœopath, made of a highly triturated substance, fitted to enter at once into the circulation, will prove a good deal more efficacious than a larger but coarser dose. Your sulphate of lime, which you call plaster, would not produce much effect on vegetation, if applied in chunks instead of being ground—and the finer it is ground, the better. Common road dust is almost as good, however,—not because of the droppings it contains, which are inconsiderable, but because the hoofs of horses and wheels of wagons

have beaten it into a fine powder, which the water will dissolve and the plant will drink. This pulverizing and grinding process seems to refine, etherealize and spiritualize matter, making it almost instinct with life. Certain it is that only the finer particles of the mineral world will enter into the composition of plants; and it is only the finer particles of organized matter out of which the spirit of man builds itself a habitation of flesh. In both cases the matter must be first dissolved and made into a nourishing liquid, before it can be assimilated and become a part of the organism.

There is one other point to which I wished to call your attention, but which time will not permit me to dwell upon, though I cannot refrain from referring to it briefly. It is the importance of paying more attention to breeding and raising better stock. There is no shortsightedness so suicidal as that of breeding from scrubs and common blood, when that which is so much better is within your reach. No practice among our farmers is so "penny wise and pound foolish" as that of sticking to feeble and worthless yearling bulls, when, for a hundred to five hundred dollars, every neighborhood might be supplied with the best blood in the world—that which is sure to transmit its own qualities. I will not attempt to say what blood you should select; but I urge you to be sure that it is adapted to the purposes for which you are breeding. If you are breeding for the dairy, you must select a bull from a good milking family, and not only this, but one bearing all the marks of a good milking family. Put your trust in no other, and raise only the calves from your best milking cows. Never trust a native male nor a grade, for poor qualities are just as surely transmissible as good qualities. If you trust a grade male, however fair and promising he may look, you may find yourself breeding from the wrong side of the cross. The poor blood in him may prove the more potent. Therefore use none but pure blooded males, well-marked and having an unexceptionable pedigree. You cannot afford to raise stock, at this day and age of the world, from any other. Get the best, to begin with, and keep getting the best to the end of the chapter. You will find it to pay.

The same care that I have indicated in breeding, we must exercise in every department of the farm, if we would have it pay. We must use fertilizers judiciously, select our seed with care, and cultivate our soil in the best manner. And we must look also after our own and the educational and moral welfare of the community at large. We cannot too soon begin a new and thoroughly practical system of education for our children, bearing in mind the fact that they will be the kind of men and women we make them. If we do not live to reap the reward here, we can safely trust to Providence to give it to us somewhere in the future.

For every sower must one day reap
 Fruit from the seed he has sown;
 How carefully then it becomes us to keep
 A watchful eye on the seed, and seek
 To show what is good, that we may not weep
 To receive our own!

Mr. Bruce, of Madison, congratulated the convention upon its hearing two such excellent addresses. He commended the instructions in one of them, suggesting an elevation in the system of farming. He

also hoped the day was coming when the State would do more for dairymen's associations than it has done, establish an experimental dairy farm, &c. Then would agriculture rise to its true dignity.

Mr. L. B. Arnold, of Ithaca—I second the gentleman's sentiments. I can attest to the usefulness of the microscope. I have used a \$25 microscope with good effect in examining rennets. The farmer has many leisure hours, and during these could employ his time with the microscope. It is to be regretted that they do not use it more. I found nothing in cheese with my instrument, nor even with one of higher power. By the microscope you learn of minute fungi and detect their presence, as you can in no other way.

The President—I wish to announce that our social gathering will be held at the house kept by Mr. Proctor, where we met last year. I wish also to request that there be perfect freedom of discussion.

Mr. Farrington, of Canada, rose to speak concerning the resolution of Mr. Hawley. He said, on his side of the line they looked with interest on American dairy matters. On his side it was acknowledged that this side was ahead in these matters. Canada people read with interest anything pertaining to the advancement of American dairying.

And so do the people of England, as witness how their *Milk Journal* and other papers copy from your proceedings. He, therefore congratulated the people of this State on the action of the Legislature in supporting scientific men, who might further the interests of dairying. He hoped that this resolution of Mr. Hawley's would pass.

The resolution was adopted.

The President—It is hoped that the ladies will be present in good numbers at the social to-morrow evening.

Mr. Weeks—I move that the chair appoint a committee of three to institute a "Question Drawer." Carried.

Harris Lewis, of Herkimer, Farrington, of Yates, and Straight, of Ohio, were appointed as this committee.

The Secretary also moved that a committee of three be appointed to draft resolutions to the memory of J. B. Lyman, deceased, formerly agricultural editor of the *New York Tribune*.

Messrs. Ingraham, of Jefferson, Arnold, of Tompkins, and Curtis, of Oneida, were appointed such committee.

PAPER OF B. B. MOON, ESQ.

B. B. Moon, Esq., of Herkimer, read the following paper on "The effect of varied manipulations on the quality of cheese. He said:

At the request of your Secretary, to prepare a brief paper upon some topic relating to the interest which this convention has met to promote, I offer for your consideration a few thoughts upon the subject, "The effects of varied manipulations upon the quality of cheese." Among the most prominent manipulations that affect the quality of cheese are the temperatures at different stages of the process; aeration of the milk and curds; quantity of rennet and salt; pressure upon the particles of curd while cooking, caused by the depth of whey in the vat, and skimming. There are other influences that greatly affect the quality of the product, such as the breed of cows; kind of feed from which the milk is produced, cleanliness at the dairy and at the factory, and others that the experienced dairyman will

readily suggest. I confine my remarks to those first mentioned for the reason that they are generally considered to be under the more direct control of the manufacturer. Milk when first drawn from the cow is ordinarily at the temperature of 98°. At this degree of heat, decomposition takes place with great rapidity, and in very warm weather the putrefactive fermentation is induced and frequently becomes the leading or controlling order, generating offensive gases, materially impairing, if not actually poisoning, the entire product. It is then of prime importance that the decomposition be, in part, arrested. It may be retarded by increasing or diminishing the temperature of 98°. It is commonly effected by decreasing the temperature. If reduced to 32° decomposition for all practical purposes would be totally suspended. Hence 98° and 30° may be considered the extremes of rapid and slow decomposition. The mean average of these extremes, 65°, is the degree of temperature that has given me the best results as a starting point for the operations of cheese-making, both as to quantity and quality of product. There is a natural ripening process, which it is desirable that all, or a portion at least, of the milk shall undergo before being made into cheese. This ripening process has been called by many the lactic fermentation. I have no scientific data upon which to base general principles, but many facts in my experience point to this conclusion, that a reduction of temperature of new milk retards the vigor of the lactic and putrefactive fermentations in different ratios. To illustrate, we may use the mathematical expressions of geometrical and arithmetical ratios. That is, as the reduction of temperature takes place, the putrefactive fermentation decreases in the greater or geometrical ratio, while the lactic decreases in the lesser or arithmetical ratio. Now, when the reduction of temperature has taken place at about 65°, the activity of the putrefactive fermentation may be considered at zero, while the lactic, whose activity decreased in the lesser ratio, now becomes the leading or controlling order of fermentation. The night's milk being allowed to stand until morning, under these conditions, the lactic fermentation secures, so to speak, a start sufficient to insure its supremacy, while the mass of milk is again heated for the purpose of coagulating the milk and cooking the curd. I have never observed that any particular degree of temperature of milk at the time of the application of rennet affects the quality of cheese, except in combination with other elements. High temperature, other conditions being the same, requires less rennet to coagulate the milk in a given time. Again, distinguished writers and experimenters unite in affirming that the "breaking down," or in other words, the curing process of cheese is hastened by using larger quantities of rennet. The consolidation of the curds after coagulation is effected by the combined action of rennet, temperature and pressure, and is usually called scalding or cooking. It has much to do in respect to texture, flavor and the keeping qualities of the cheese. At this point we will discuss the subject of pressure under which the particles of curd are cooked, caused by the depth of the mass in the vat. It is an element that must be taken into account in the cheese problem.

A cubic foot of water weighs about 62½ pounds. A like quantity of whey or milk will vary but little from this weight. The depth of vats in general use is from 15 to 24 inches. Take one of these vats and fill it say to the depth of 20 inches, and there will be a pressure, omitting fractions, of 104 pounds on each square foot, or 11½ ounces on each

square inch of bottom surface. Since the pressure of liquids at any given point in the mass is equal in all directions, it follows that the stirring of the mass changes the amount of pressure upon any particle of curd as it rises or settles in the liquid. If curds settle to the bottom of a deep vat of whey, while in the process of cooking and are stirred only enough to prevent scorching, they will become more compact, that is the whey or moisture will be more thoroughly expelled from the body of each particle of curd, than from those curds cooked in a vat in which the depth of the liquid was less. Now should it be our object to make a cheese that shall cure rapidly, we would, so far as these operations are concerned, set the milk at a rather low temperature, because we might then use more rennet and yet not produce a rapid expulsion of whey. Moisture and heat are necessary conditions of fermentation, hence we should remove the whey from the vat as it became separated by the action of the rennet and heat, thereby reducing the pressure under which the curd was being cooked. Should it be our object to make cheese that will take more time to ripen, we should, with respect to these same operations, set at a higher temperature with less rennet, retain all the whey in the vat and perhaps adding water that we might get a greater pressure upon the curds during the cooking process. The effect of these manipulations in the first case would be the hastening of the ripening process of the cheese, due to the greater amount of rennet used and the retention of moisture in the curds in consequence of the diminished pressure under which they were cooked. The effect in the second case would be to retard the curing process, by using less rennet and the better expulsion of moisture from the curds, thereby delaying fermentation until an absorption of the necessary moisture from the atmosphere takes place. The flavor of cheese is affected by the various kinds of food from which milk is produced, by the ingredients used in the manufacture, and also by certain conditions of fermentation. Salt retards fermentation, hence it is used in greater or less quantities as the time between production and consumption is to be long or short. It is also the principal agent in producing that quality of cheese described as sharp. A highly salted cheese cured in a high temperature, say 90°, will become sharp, accompanied with an objectionable flavor. If cured in a lower temperature, say 70°, it will require a longer time to cure, but the final result will be sharpness with pure flavor. A lightly salted cheese cured in a high temperature will soon become worthless. If in a low temperature it will be mild even to tastelessness. Acidity is another element that modifies the action of rennet. It aids in the expulsion of moisture from the curds during the cooking process, and is relied upon chiefly to give solidity to cheese for shipping purposes. Solidity, however, is acquired, to a great extent, by aeration of curds in the sink. If curds are hurried from sink to press, there frequently results a porosity composed of very large holes, at some distance from each other, throughout the cheese. The remedy for this kind of porosity is the more thorough airing of the curds in the sink, necessitating two or more sinks in factories having several vats. The porosity, due to the want of acidity, manifests itself in a multitude of small cavities. The effect of airing the milk is to secure a clean flavor. By exposing to the air, the obnoxious "odors" are allowed to escape. Purity of air in the curing-room is a necessity. Many of our factories have their drying rooms directly above their making and press

rooms, and so constructed that the steam vats, the exhalations from half rotten floors, the miasmatic atmosphere from uncleaned gutters, and foul odors from unmentioned corners, find their way, laden with germs of putrefaction into these curing rooms, surrounding and penetrating the cheese, and filling every nook and corner.

Such conditions are frequently the cause of bad flavor, and worse appearances. Purity of air in the curing room is a condition under control, and should be strictly attended to during those heated terms of our American summers. There are several manifestations of an objectionable nature occurring in the drying rooms during the season, of the causes of which I have never fully satisfied myself. Yet I have modes of action for their prevention, which, perhaps, may assist others in their treatment. Among these manifestations is leaking. There are three distinct kinds that have taken place under my management. The first is a leaking soon after being taken from the press. I remedy this by increasing the depth of milk in the vat. My theory is that there is too much moisture contained in the curds, by being cooked under too light a pressure. The second kind takes place from three to ten days after being taken from the press, and proceeds from cheese made from milk nearly sour. Especially do we find this difficulty present in the cheese room when any considerable portion of the milk is from cows fed with sour whey. The third kind is of a very oily nature, proceeding from cheese upon which a strong acid was allowed to develop, highly salted, and placed in a room of high temperature to cure. The remedy for this kind of leakage is to reduce the temperature of the drying room. I have sometimes thought that this third kind of leakage was but the simple melting of the small parts of butter held mechanically in the cheese.

With reference to the practice of skimming, I may remark that we can best comprehend its effects by visiting some of our cheese markets in the spring, and marking the difference in quality, and noting its effect upon the market. In general it deteriorates the quality of the product, it clogs the market with millions of pounds of dry, tough, unyielding cheese; cheese that are impaired in flavor, that are imperfect in texture, and deficient in keeping qualities. It prevents consumption; it decreases demand; it drags down prices; hinders production and the proper development of our national resources. Why the world-wide reputation of Herkimer county for excellent cheese? It is not because of the superiority of her cheese-makers, it is not to the greater purity of her purling streams or her sweeter pasturage, but, in the main, to that great economical fact, that her dairymen in early times had the wisdom and courage to exert their entire skill in the production of a first-class article. All honor to her Arnolds, her Thayers, her Salisburys, and scores of other industrious farmers, who laid broad the foundations of prosperity in the region of their chosen homes. It is a great industrial fact that excellence of production brings prosperity in its train. Let us not adopt the specious reasoning of those who would kill the hen that lays the golden egg, but rather let us practice feeding well our cows that we may secure rich, golden milk. Let science lend her aid in producing therefrom the mellow, nutritious products of the dairy, and ere long no Stilton, or Cheddar, or Edam, or Gruyere, shall lead us in the markets of the world.

Mr. Burnham asked if a cheese could not be made from sour milk that would not leak.

Mr. Moon would not answer in the negative, but he had never been able to accomplish it.

Mr. Farrington, of Chautauqua—I agree with Mr. Moon in most that he said, but do think that working milk, unskimmed of its superfluous cream, is a losing operation. The gentleman gave statistics to show that saving this cream made a considerable difference. Skimming this cream does not affect the quality of the cheese, while it is saved by being made into butter.

Mr. Budlong, of Herkimer—I do not believe in skimming. I believe in making a cheese that we are not ashamed to put a brand on. There will be no waste, if the milk is agitated. [Applause.]

Mr. Farrington—I never saw milk agitated but what it left the whey muddy, showing a waste. In the factory practice the milk takes on acidity sooner than in the dairy practice, and the separation of cream in consequence can never be worked back into cheese. The richness of the cheese depends upon the excellence in manufacture.

Mr. Wight—I'm interested in the subject of skimming milk. It has not been experimented upon sufficiently as yet to determine the profit to be derived. But in the early months I do not believe in skimming. [Applause.] The cheese that has the cream in it is the better cheese. You cannot get as much cheese where you skim as where you do not. You cannot get such a good quality. Such is my experience. The danger of skimming is that it may be carried to excess. One point in Mr. Moon's essay seems to me a little blind. I would like to ask him why a cheese which has been made with the whey in the vat has more water in it than when the whey is partly withdrawn.

Mr. Moon—I have arrived at this fact from study and observation. I drew down the whey and found that there was a certain moisture. I left it in and the moisture was decreased. I believe that it was the pressure of the whey that decreased the moisture.

Mr. Farrington, of Canada—As regards this pressure, as it is equal on all sides of the curd, I don't see how that could be the cause. I think the weather has a great deal to do about leaky cheese.

Mr. Farrington, of Yates—I don't advocate indiscriminate skimming, but I can prove by facts that partial skimming is proper.

Mr. Burnham in the spring of the year made an experiment by skimming one vat and leaving the other unskimmed. When he sold the cheese he made from each, the skimmed cheese sold for more money than the other.

Mr. Wright—Two years ago I made whey butter, but found it did not pay.

Mr. Budlong, of Herkimer, thought if the curd was well cooked and left long enough in the vat there would be no leaky cheese.

Dr. Wight only knew of leaky cheese as arising from milk too sour, or from curd taken too soon from the vat.

Mr. Scoville referred to having seen cream over a foot thick on a whey vat. This enormous waste of cream was the occasion of serious loss to the patrons, that ought to be remedied.

S. A. Farrington—I know a factory at which was made 2,600 lbs. of whey butter. Why not have made that into good butter and sold it for 50c per pound instead of 30c.

Mr. Ellison agreed with both sides. Cream once separated from the milk can never again be incorporated with it. Leaky cheese arise from

too much acidity; and, again, the practice of keeping curd from one day to the next will produce the same result. He was opposed to the policy of skimming milk as detrimental to the quality of cheese, and, therefore, to American interests. The reputation of our cheese stands high with the English. Let us keep raising it.

Mr. Budlong referred again to the question of leaky cheese as affected by the pressure of whey in the vat. If the pressure of whey in the vat extracts the whey from the curd, why does not the pressure in the press extract it also? The whey is only extracted by action of cooking or acidity. If curd is sufficiently cured before it takes on acidity it will never be leaky.

Mr. Moon—Take a vat and fill it half full of milk, and another vat and fill it full of milk. Set them in the usual way and work them both alike, and the one which was half full will have its curd moister than the other.

A gentleman stated that many sour cheese leak because put to press too cold.

Mr. Hunt, of Madison, would guarantee to make a leaky cheese at any given time. It was all a matter of making.

At this point the convention adjourned to 7 o'clock.

EVENING SESSION.

At half-past seven the evening session was called to order by General B. F. Bruce, of Madison, who announced as the first order of business the reading of a paper by the secretary, Gardner B. Weeks, of Onondaga:

THREE YEARS' EXPERIENCE IN A CREAMERY.

Mr. President and Gentlemen:—In offering a few statistics and remarks on the subject of creameries, I wish one point to be understood at the onset. What I shall say, comes from an experience gained in the last three years, and under circumstances peculiarly adapted to lead me to a somewhat warped and biased opinion upon the matter.

In 1869, having heard for years of the creamery system as practiced in Orange and other counties of our State, I visited one located in Madison county. I fancy (or, as a Yankee would say "I guess,") that I somehow obtained a more favorable impression than facts justified, or the statement made to me warranted. Perhaps, too, the statements themselves were too highly colored. At all events I determined to try an experiment in this direction, and leased a newly-erected factory in an adjoining county, located in a grain region of acknowledged excellence. I ought to state that up to this time I had had eight years' experience in conducting a large cheese factory in this (Oneida) county.

The factory which I leased in the spring of 1870 was 30 by 80 feet, of two stories,—well and substantially built—amply furnished with the necessary apparatus for making cheese from the milk of 400 cows, and provided, in addition, with a tank or cistern fourteen feet square, and capable of holding 10,000 pounds or more of milk in the deep cooler pails. There should have been, likewise, a cool, airy cellar, a convenience which is almost an imperative necessity in a creamery. To these I added about \$300 worth of utensils for butter making, consisting of about 200 cooler pails (8x20), distributing can, butter cooler, cream pails, four 1½ barrel dash churns, &c. The butter cooler was simply a square tin vessel, about four feet long, two and a half feet wide, and

eight to ten inches deep. Into this the butter was put after churning, and washing, and salting had been done, and kept in it until the final working, the next day. Of course the cooler floated in the water tank, and was provided with a closely-fitting cover.

The season of 1870 opened May 24 and closed October 31, covering 161 days. We received 803,662 pounds of milk (from about 250 cows.) We sold 16,345½ pounds of butter, at an average price, net, of 36 31-100 cents per pound, realizing \$5,935.24. Of cheese we sold 57,834½ pounds at an average of 9 98-100 cents, amounting to \$5,672.65. This gives a pound of butter and cheese to each 10 8-10 pounds of milk. The butter made was mostly shipped to New York, twice weekly, by express, and we rarely had any sold below the highest market price as quoted in the *Producers' Price Current*.

In August, the butter market being quiet and prices not being satisfactory, we suspended shipments for several weeks, storing our butter in a good cellar not far distant. We did this counter to the judgment and advice of our commission merchant, and the result proved that he was right and we wrong, for though the market improved somewhat, the butter did not, and the deterioration in the quality of the butter more than counterbalanced the improvement in the market price, and we lost some money in consequence of holding. This I believe to be almost universally true of creamery butter, and I therefore set it down as one of the lessons drawn from my experience.

We made cheese of various qualities; whole milk on Saturdays, to avoid Sunday labor, keeping Saturday night's and Sunday's messes until Monday; then, for quite a portion of the season, we simply made butter from the cream rising on the evening milk, after standing until morning, and then adding to this milk the morning's mess entirely unskimmed. This gave us a fair quality of cheese, tolerably meaty, of excellent flavor, and probably better adapted than whole milk cheese to the use of that large class of community, who claim that they cannot eat cheese because it is too rich.

While making cheese and butter on this half-skimming plan, we experimented somewhat, and we found that we invariably obtained more butter when the night's milk stood for twelve hours in the ordinary cheese vats, than when set for the same length of time in the deep cooler pails and set in the water tank.

This we established by test, again and again repeated. Whether the cause is to be found in the fact that the milk was brought to a lower temperature in the pails than in the vats, (the spring water standing at about 54 degrees,) whether because of the greater loss of cream adhering to the pails than to the sides of the vats, or whether, as I suspect, the much discussed question of deep versus shallow setting of milk does not here arise, and the result of the tests referred to militates against deep setting. The depth of the milk in the pails was probably twice as much as that in the vats.

Through the early and latter parts of the season, we skimmed the night's mess of milk as just described, and also took 24 hours' cream from the morning's mess, or, in creamery parlance, we skimmed 12 and 24 hours. As compared with the plan just described,—namely, skimming the night's milk after 12 hours, and the morning's not at all,—we should naturally expect to obtain two or three times as much butter by skimming the one 12 and the other 24. But we did not, and in subsequent years we have not obtained any such result.

Twelve hours' cream from the night's mess of milk alone would give from one-half to three-fifths as much butter as 12 hours' cream from the one mess and 24 hours' cream from the other. This is a problem which I have never been able to solve. Perhaps if I had been so situated that I could have been constantly or frequently at the factory, I might have discovered the reason; but I only made short visits there at intervals of about ten days, and was rarely there during the morning hours of work.

I regret that I am not able to give that solid value to these statistics of relative amount of butter and cheese made under these varying systems, that they would possess if there could be given in connection therewith the date when the changes were made, and the amount of cheese and butter produced from a given and exact amount of milk. These I could have obtained very readily, if I could have commanded the time for the preparation of this paper, which I expected to have had when I ventured to announce it in the programme of this meeting.

I am convinced, however, for reasons that will appear a little farther on, that the mistake was made by us in the season of 1870 of skimming too much. This was especially unwise in the earlier part of the season, when milk is naturally much poorer in quality than towards autumn.

We were unfortunate enough to engage a person to superintend our factory operations who was totally incompetent. Consequently, we worked at serious disadvantage, and had to feel our way step by step.

We paid for milk that year per 100 pounds, May, 1.15; June, 1.10; July, 1.10; August, 1.10; September, 1.30; October, 1.20. An average of 1.13 1-10, or an equivalent of $13\frac{1}{2}$ to $13\frac{3}{4}$ cents per pound for cheese.

The average price for cheese in factories making returns to this association, for that year, as found upon page 176 of our sixth annual report, was 13 9-10 cents.

The financial results of the season's business were not very satisfactory. The balance was on the right side of the account, but it was small, scarcely more than covering the amount we had invested in butter apparatus.

For arriving at the price to be paid for milk, three regular cheese factories of established reputation and acknowledged success were selected at the beginning of the season, and we were to pay as much for milk as it netted at any of these factories, month by month. This plan did not work satisfactorily, because the factories selected did not sell their cheese until toward the close of the season, while we wished to pay, and did pay, for milk six weeks after the close of the month in which it was received.

The season of 1871 opened April 25, and closed October 21, extending 180 days. Milk received, 1,032,322 pounds (from about 300 cows), for which we paid \$9,379.87. The lowest price paid per 100 pounds of milk for July, 77 cents; the highest, October, \$1.10; the average 90.9 cents per 100 pounds. Pounds of butter made, 20,200, for which we received \$5,776.29, averaging $28\frac{1}{2}$ cents net, express charges being \$1.40 per 100 pounds gross, and commission five per cent. Pounds of cheese sold, 72,400, realizing \$6,250, averaging $8\frac{5}{8}$ cents. The average price of factories reporting to this society that year was 11.73 cents per pound.

The pounds of milk required for a pound of cheese and butter, the average for the season, was 11 1-10.

We pursued the same course in regard to making cheese of various quality,—skimmed, half-skimmed, and a little full milk. The first-named was almost unprecedentedly low in price in the New York market, and a portion of ours of that grade was sold at a small price. We had been gaining in some points, and availing ourselves of Mr. Arnold's advice, and the experience of our first year's labor, we avoided some of the mistakes then made. We used a low heat in making our skimmed cheese, rarely exceeding 86 to 90 degrees, and we aimed to keep the cheese in a temperature of 70 to 78 degrees, as soon as they were taken from the press, and until 30 or more days old.

There has always been, with us, far more variation in the quality of skimmed cheese than in half-skims or full milk.

And so, although many of our full-skimmed cheese were poor, very poor, and sold at a low price, there were, on the other hand, many that showed a good deal of quality, and brought more money. It was not an uncommon occurrence for merchants in villages near us to come and select cheeses for cutting up. They were provided with a cheese-tryer, and freely tested all sorts and qualities,—as frequently as otherwise their choice fell upon full-skimmed cheeses. (In one case we sold nearly 200 cheeses to one party, at one time, for cutting up in an inland city, and nearly or quite three-fourths of them were skimmed cheeses, made in September and October, and we received for them within 1½ cents a pound of the highest market price.) There was no deception at all used. The cheeses were sold by us and bought by our customer solely on their merits, and the tryer was put into nearly or quite every cheese by him when he received them. Hundreds of our skimmed cheeses were thus cut up in that region of country, and with general acceptance.

I would not like to be understood as saying that they were, any of them, of fine quality; but that they were not white oak cheeses, must be obvious from the fact that so many were thus used. We did not sell them for skimmed cheeses,—nor, on the other hand, did we sell them for full milk cheeses. No deception was ever used, no misrepresentations were ever made in regard to them. They were in all cases sold on their merits, and I contend here that it matters not to the buyer and the consumer what our cheeses are made of,—be it dish water, or spring water, or skimmed milk, so long as they are clean, wholesome, and have quality sufficient to satisfy the purchaser and the eater.

And just here may I mention another lesson which I have learned in this matter? I refer to the common custom of making skimmed cheeses thin. I believe this to be a mistake, for it brands the cheese as skimmed, and, therefore, no matter how good the quality, it is not, and cannot be sold upon its merits. There is a prejudice in the mind of the purchaser which he will carry into the price that he will pay for the goods. We might just as well stencil each cheese, "This cheese is made from skimmed milk." Now, as some skimmed cheeses show more quality, and are in every respect better than some full-milk cheese, it is obviously unfair so to brand the skimmed cheese that it cannot have fair play,—that it cannot receive unprejudiced examination.

Use no deception or prevarication, but let the cheese stand or fall simply only upon its merits.

Again, thin cheeses lose more moisture than thick ones, and, therefore, become dryer; and, certainly, skimmed cheeses, even if rightly made and in their best estate, have no superfluous moisture.

Therefore, I would make skimmed milk cheeses of the same shape as full-milk cheeses,—14 to 15½ inches in diameter, and 9 to 10 inches thick.

The prices paid for milk in 1871 were low. Butter was proportionately higher in market than cheese, and the financial results, though not showing large profits, were yet satisfactory. We agreed upon another system of arriving at the price to be paid for milk, using the *Weekly Producers' Price Current*, published in New York each Saturday, as a basis. We took the highest quotation on cheese named therein, week by week, for a month. Averaging this, we had arrived at a basis on which to pay for milk delivered to us during the month preceding. Because, cheese made from milk received in May, for instance, could not be ready for market until June, and, therefore, June prices for cheese should establish prices for May milk.

From this highest quotation in New York our patrons allowed us to deduct one cent a pound, as the cost of freighting cheese to that market and having it sold there by a commission-house,—and two cents a pound to cover cost of making the cheese, furnishing materials used in making, &c. Each ten pounds of milk being considered an equivalent for a pound of cheese. (These allowances are liberal, but it must be remembered that the factory was small.) So that, to arrive at the price to be paid for May milk, if the highest average price for cheese in June, in New York, was 14½ cents a pound, we paid 11½ cents, net, for each ten pounds of milk,—or, \$1.15 per 100 pounds.

This was fully due six weeks after the close of May, or, on the 15th of July,—and it was stipulated that if we were not prepared to pay in full at this date, any or all the patrons could then demand and must receive two-thirds of the full amount due them for that month. I am thus particular to state this plan in detail, because I have had many inquiries on this point. It worked entirely without friction; there being no chance for divergence of views, and therefore no hard feeling could arise on either side.

I am bound to say, however, that this plan will not always insure profits to the buyer. "It's a poor rule that won't work both ways," and this one worked both ways with us. In 1871 it enabled us to show a handsome margin, considering the smallness of the business, while in 1872 it left us with no profit whatever. The quotations in the circular alluded to were high throughout the latter part of the season. Cheese was therein quoted at 14¾ and 14½ cents, when it was in most districts in the country impossible to obtain more than 12 to 13 cents for the best.

The season of 1872 extended from April 22d to October 19th.—180 days. Our dairy numbered rather more than 300 cows, and we received 1,024,310 pounds of milk. From this amount of milk we should have produced—had we made only cheese,—from 102,400 to 105,000 pounds of cheese. We did make from it 18,262 pounds of butter and 76,818 pounds of cheese,—95,080 pounds of both,—requiring 10 77-100 pounds of milk for a pound of both. For the butter we re-

alized, net, \$5,063.23, an average of 27 $\frac{3}{4}$ cents per pound,—butter being low in price all through the season.

For the cheese we received \$7,341.48, an average of 9 56-100 cents. per pound of this cheese; 20,153 lbs. were sold to cutters of cheese in adjoining villages, and retailed at the factory, realizing almost 12 cents a pound. A somewhat large amount, 22,419 lbs., was sold to buyers at an average of nearly 13 cents a pound. The balance, 34,722 lbs., was of low, and very low, grades, and brought us an average of only 6 1-10 cents a pound, after deducting freights, cartages, commission charges, and loss of weights in New York, the latter a heavy item. It will be noticed that we received, in 1872, almost the same amount of milk as in 1871—7,184 lbs. less. From this less amount of milk we made 1,938 lbs. of butter less, and our butter brought an average of $\frac{3}{4}$ c. a pound less than in 1871; and we made 3,418 lbs. of cheese more, and our cheese averaged 93 $\frac{1}{2}$ c. per 100 lbs. more.

I am sorry to be obliged to add that our milk in 1872 (albeit we had nearly 8,000 lbs. less,) cost us \$1,245.91 more than in 1871. The average price paid per 100 lbs. of milk in 1871 being, as already stated, 90 9-10 cents, while in 1872 the rate was \$1.03 $\frac{3}{4}$ cents; a difference, it is true, of only 12 8-10 cents per hundred, and yet large enough to sweep away any and all the profits which we had hoped for as the result of the season's operations. I explain this result from two causes. In the first place, the price paid for milk was based upon the market price of cheese, and cheese was for a considerable part of the season relatively higher than butter. Then, skimmed cheese, too, was in light demand, and prices ruled low.

Then, again, our cheesemaker, although he had done good work the previous season, made a great deal of poor cheese in 1872. His early skimmed cheese were by far the poorest lot that I ever saw. He soon improved upon them, but the poor ones seriously reduced the average for all.

A few general facts and suggestions, and I will close.

Our factory was located in a grain region, but the milk brought to us was generally of good quality and tolerably well cared for by the dairymen. At one time, in 1870, the driver of one team, which drew milk from a large dairy a long distance, thought to use extra diligence in caring for his milk, and thereupon covered the cans with a thick buffalo robe as a protection from the intense rays of the sun. I need not say that we had sour milk and sour cheese, and trouble generally, until the matter was ferreted out and the buffalo robe left at home, until the winds and snows of winter should put it to a use more legitimate.

Our creamery was, in many respects, conducted loosely. Money could have been made, even in 1872, had everything been more sharply looked to. I am confident that many creameries have made money during the past year, and if my poor exhibit shall lead them to give to us, or to the public, the facts and figures of their business, I shall have accomplished one leading design I had in view in the preparation of this paper. But I very much question whether our knowledge touching the proper manipulation of skimmed milk so as to produce the most satisfactory results has reached a point that renders even the best conducted creameries more profitable than the best conducted cheese factories.

A better result has been a thousand times figured out on paper, by

taking the statistics of a day or a week at a time, but in all such calculations which have come under my notice, there is never nearly enough margin left for contingencies that are constantly arising—for losses that inevitably occur.

What our American cheese factories most lack to-day, is properly constructed curing houses. Then, when this want is met, it is my judgment that most or all factories should be provided with the amplest facilities for making both butter and cheese. There are times in almost every season when butter is relatively much dearer than cheese, and sometimes this occurs in the heated terms, when the making of cheese is a burden and the selling of it an exasperation. At such times make butter, and the best quality of skimmed cheese. I suspect that the most profitable course a factory can pursue—throughout the entire season—is to skim 12 hours' cream from the night's milk, and none at all from the morning's.

This gives a good deal of butter, and of a very superior quality, for the cream which rises during the first twelve hours, not alone constitutes a good share of all the cream in the milk, but it is the very best—the "*creme de la creme*." And the cheeses need not show the loss to any appreciable extent. Indeed, if rightly manufactured, few buyers, dealers or consumers could detect any loss of quality—I care not how shrewd and experienced they may be. I said, "rightly manufactured," and I mean just that. Very few of our cheese-makers have yet had any experience in handling skimmed milk, and fewer still know how to produce this "right" result. But, if the call comes for manufacturers with such qualifications, it will not be long before it will be nobly responded to.

I am exceedingly interested in this problem of making skimmed milk cheeses, and am convinced that the day is coming, and is not far distant, either, when soft, meaty, wholesome, delicious cheese will be made from skimmed milk; when the structure of the casein (as Mr. Arnold puts it,) shall be as thoroughly broken down as in the best full-milk cheeses. I am the more convinced of this from what Mr. Willard told us, years ago, of the sample of cheese shown him by Prof. Voelcker, in London, made from milk divested of all the cream that could be separated, and yet so good a judge as Mr. Willard, finding it so buttery and so excellent, pronounced it as doubtless made from full milk. I am so convinced, still further, by what Prof. Caldwell told us, two years ago, of the celebrated and high-priced cheese of continental Europe, several of the very best of which are made—and have been made—of skimmed or partly skimmed milk. And I am led to the same conclusion, by my own experience, small and unsatisfactory as it has been in some of its aspects.

The conclusion, then, of the whole matter in my own mind is this: Let the great majority of our cheese factories continue to make full-milk cheese and make them as good as possible. But let the investigations, tests and experiments respecting the manufacture of skim milk cheese be pushed with vigor and patience and the result will be a success beyond our highest present anticipations.

At the conclusion of Mr. Weeks' reading, Mr. Farrington, of Yates, Straight, of Ohio, Seoville, of Oneida, and Farrington, of Canada, put some pertinent questions. These Mr. W. asked to wait for the reading of a paper to follow on another day which would cover the ground on which questions were asked.

Mr. Scoville, of Oneida, was called upon for a paper on the properties of milk and the result of experiments he had made with it. He said:

PART OF MR. SCOVILLE'S PAPER.

The principle embodied in the law imposing a fine upon the patron who should retain the strippings at home for the purpose of using it for making butter, or otherwise, led me to make some experiments, which, though not satisfactory to myself, yet I present them at this time hoping it will stimulate others to make similar experiments, and I trust next year myself to be able to make more extended observations. It represents the percentage of cream from the milk first drawn from the udder and the strippings.

No.	1	2	3	4	5	6	7	8	9	10	11	12
No. 1	11	9	7	8	5	11	7	6	5	10	47	48
per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Strippings.	47	48	33	33	35	45	29	33	65	39		

The samples of milk were placed in the common per cent. glass, and stood in the milk room about 36 hours, and in nearly every instance the cream was hard and firm.

These observations led me to inquire what are the constituents of milk as shown by analysis, and as a matter of reference, I append the results of a few observations made by several able chemists, both from healthy and diseased cows.

Constituents.	1	2	3	4	5	6	7	8	9	10	11	12
Water.....	85.26	85.86	85.6	87.0	92.4	86.7	92.3	87.7	86.9	57.8	49.0	49.4
Butter.....	4.40	4.42	4.7	3.5	1.9	3.4	2.0	1.9	4.0	12.4	42.4	31.1
Sugar.....	3.97	1.79	4.8	1.5	1.0	1.8	1.0	1.3	4.2	15.7	3.8	1.9
Casein.....	5.71	7.08	4.3	6.8	3.6	6.9	3.7	7.4	4.4	13.1	4.2	16.5
Salts.....	0.66	0.85	0.6	1.2	1.1	1.2	1.0	1.7	0.5	1.0	0.6	1.1
Total....	100.00	100.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

No. 1 is the milk of a cow kept for family use in the city of New York; No. 2, of swill-fed cows from distillery stables in New York; No. 3, country milk furnished by a dealer to customers in New York; No. 4, milk as drawn from cows in Williamsburg distillery stables; No. 5, sample of same as delivered to customers; No. 6, milk as drawn from cows in New York distillery stables; No. 7, milk from the same delivered to the customers; No. 8, milk from a sick cow, Williamsburg distillery stables; No. 9, sample of milk used by Gail Borden for preparing the "condensed milk"; No. 10, condensed milk as prepared from No. 9; No. 11, cream from same milk, No. 9; and No. 12, cream from milk of distillery cows at Brooklyn.

In the tables the bad milk is at once perceptible from the large proportion of casein, while the sugar and often the butter is as disproportionately small. The large amount of saline matter in the bad milk is caused by the addition of salt for the purpose of disguising the adulteration with water.

Though the chemist can show that such milk is generally bad, yet its poisonous qualities are more apparent by its use. From the diseases of young children traced directly to the use of swill milk, it is only wonderful that the death rate does not rise more rapidly than it does.

Mr. Wight recurred to the paper of Mr. Weeks, and hoped Mr. Straight would give the benefit of his experience in Ohio.

Mr. Straight said he came for information, not to impart it. Didn't think he knew much about the matter. Others were older and wiser. But he had followed the business for four years of making cheese from partly skimmed milk. Had paid the past year $10\frac{1}{2}$ cents per 10 pounds of milk, and yet the result satisfied. We have been figuring out the result for four years, but we are unable to tell yet how we will make it. Lady operators from New York have made a success of our factory. Others have failed. It seemed to rest largely with the maker, whether the result was good or bad.

Mr. Straight will continue on this same line for a time yet. He hopes and expects to make a success of the system.

Mr. Willard, of Herkimer, wanted to know the price obtained per pound.

Mr. Straight—The average price obtained in the State.

Dr. Wight said that churning cream sweet and putting the butter-milk into the cheese, was not a good plan; it affected the cheese. Butter made from sweet cream did not keep well. It lost its aroma. By letting the cream sour he got more butter. In reply to question said he churned sweet and sour cream at same temperature.

E. S. Munson, of Delaware, believed sweet cream should be churned at a lower temperature than sour. He spoke of dairying in Delaware. He thought the milk better than in many other places better known. He paid $117\frac{1}{2}$ cents for 100 pounds of milk in 1872, and their payments have never been less; charges $3\frac{1}{2}$ cents a pound for making butter and two cents for skimmed cheese. In reply to questions said absence of light did not in his opinion prevent color in butter, and that agitating milk does not prevent or retard the separation of cream. His cheese sold at an average of $7\frac{1}{2}$ cents. From June 1st to August 1st, 5 cents; August 1st to October 15th, 8 cts; October 15th to November 1st, 10 cents. Marketed at Norfolk, Va., largely, and at New York city.

Mr. T. D. Curtis announced that those desiring cheese-makers, and makers desiring situations, are desired to meet this morning at Messrs. Jones & Faulkner's.

The convention adjourned til 10 o'clock Wednesday morning.

SECOND DAY.

The Dairy-men's Convention began its second day's proceedings at half-past ten o'clock, yesterday morning, B. F. Bruce, of Madison, in the chair. There was a decidedly increased attendance over that of the previous day, at least ten states being represented.

CENTENNIAL EXHIBITION.

Mr. Scoville, of Oneida, moved that a committee of five be appointed to consider the request, made by the Centennial Commission to all agricultural bodies of the United States, and see what this association might do to assist in the International Exhibition.

VIENNA EXPOSITION.

Mr. Arnold, of Tompkins, said he wished to call the attention of the convention to the fact that the cheese industry of this country was not yet arranged to be represented at the Vienna Exposition.

The secretary read a circular from Prof. Caldwell, of Ithaca, requesting the association to do what it could to have the dairy interests of New York State represented at that exposition. A resolution was presented at the same time for the appointment of a committee of three to attend to this matter.

PAPER OF DAVID LEWIS, ESQ.

Mr. David W. Lewis, Esq., of New York, read the following paper on "Marketing Dairy Products:—"

Gentlemen :—I beg your attention for a few moments to the general features of marketing, to its being the objective point of production, the great business of the world, in need of all our aid, and a master of us all; to the fact that high standards, uniformity and evenness of make and continuous reliability of quality, are great helps to marketing; to the necessity for home distributing markets; to the inter-dependence of all industries in marketing their productions; and finally, to the need of free motion for person and property in order to assure the general benefit. Marketing is the natural sequence of production, the utilization or exchange of a completed form of product to promote other production; a never ending round of the concentrations of supply and the distributions of demand—in fact the circulating system of the body politic. Cities are the greater centers of the market system, the supply chests and store-rooms of the families of mankind. Float in mid-air—look down upon the convergent tracks—the hastening trains—the toiling steamers—the whitening sails and the lumbering teams, all tending thitherward and again diverging thence, carrying with them the elements of life to mind and body all over the land. Railroads and canals, highways and by-ways, are the arteries and veins and minuter blood vessels of the system, telegraphs the nerves, and moving the circulating medium of exchange, the life giving blood carrying the needed nutriment to the remotest members. Merchants and marketmen and storekeepers are the stewards of the stock, the guardians against undue hoarding and unwise spending.

Nature markets generously, the earth sends her mists and vapors, to market in the clouds, free of freight, sure of destination and certain of good returns. In the summer, showers slaking the parched ground and freshening the face of nature; or in the snow flake, sifting softly down, covering field and farm and forest in its downy bed, gently tucking in the tiny, tender shoots and grasses, and the million germs of life which, nestling under its wintry counterpane, wait the awakening

call of spring to birth, growth, maturity, making again rich return in the grand rounds of nature's economy.

See the boys and girls going to school—fitting for market. See the miner, deep down the shaft, loosening earth's treasures for a market. See the spindles, twisting, twirling, never tiring, working each their little thread, for market. See the rough ore, smelted in the fiery furnace, turned in the iron bar, laid as the nation's highway, for a market. Ah! the earth itself, is all in the market; it is the great warehouse, full of all treasure, waiting only the outstretching hand of man to bring it into the market of his own uses. It embraces all the grand and the minute processes of the world, thus getting ready for market and marketing.

The great living masses of men, from the man who gets his kinship with the working world through the shovel and the wheelbarrow, to the millionaire who dams up the streams of his prosperity and runs the machinery of civilization by the force of his fortune and skill, there is but one end, and but one result; it is the marketing of their minds and bodies and fortunes for the use of the world. The dairyman turns his herd upon the earth to condense from the air and water and growth of the soil, the milk which, by his skill and labor is transformed into butter and cheese for the use of men who, in their turn, are sending back to the farm the thousand aids and appliances necessary to modern life and civilization. His marketing begins at the beginning of the growth and manufacture of the product. Nature awaits direction and development at the hand of man. Wild grass and flavorless stubble must give way to the juicy and sweet and tender selections sought out by care and experience. The herd must be bred and housed and fed, and their product handled with skill and care. "There is plenty of room at the top," and the rightful ambition of his marketing is to have a production up to the time. The elevation of men implies the elevation of the products with which they are yet to be supplied. When ignorant emigration from old world society swarmed upon the country, when processes of labor were largely muscular and in the lower mechanics, then there were good markets for corresponding manufactures; but now, with universal education and the increased clanking of machinery everywhere doing the work of man, there comes market requirements for higher standards and continuous uniformity and evenness of make. This evenness and reliability of production always goes hand in hand with advanced standards of quality, and Mr. Williams, the father of the American cheese factory system, when he started his factory at Rome, began teaching dairymen the truth, since so fully demonstrated by the factories, that a standard uniform quality in a production adds largely to its distributive value.

In King Solomon's time, buyers being then all childlike and bland, they are thus referred to in the Proverbs: "It is naught, it is naught, saith the buyer, but when he has gone his way then he boasteth." Now, with the standard quality and uniform production of the factories standing up and asserting their own value, so that he that runs may read, this is a game no well regulated modern cheese buyer pretends to understand, and would attempt to gainsay their value. The dairyman having this uniformity and evenness of make abandons the old method of the cheese business, cotemporary with its dairies all different and many poor, and a thousand dairies and a thousand qualities.

to the four winds of heaven, for buyers to run to and judge of oftimes with only themselves for judge and jury. With no concentration of product, no equality of position between buyer and seller, and no sufficient standard of quality to determine any standard of price, with nothing but its scattered fragments of production, and no whole loaf like the factory offering at local centers to cut down from and distribute among consumers without waste or loss. He sees the benefits of combination and concentration in selling, and makes his offerings at his own local distributing market centers. Look at Utica, Little Falls and other local points, and can any man complain that there the value of his cheese is not brought right home to his own door. Mention the Plymouth, Fairfield, Newport and hundreds of other factories, and is not their worth stamped upon them by the name of the factory almost as much as the value of a coin by the stamp of the mint, and they are passed from hand to hand with about as much certainty, and at almost as trifling a cost as was the old bank bill currency of the several states.

Butter has a right similar benefit from the factory system, especially the benefits of a union of interests and concentration for sale, which last advances the distributive values enough to compensate for the difference between patrons. (The dairyman says my dairy is as good as the creamery, and it is possible it is. He also says my note is just as good as a bank note, and we may grant it, and yet neither his dairy nor his note will pass current with the general public quite as well as the product of the well-known creamery or the note of the well known bank.) To private dairymen, the factories leading in price must suggest the need of this evenness and uniformity of make, and careful keep and concentration in selling. Ten to twenty-five per cent. of the value of private dairies is annually lost by the lack of proper cellarage and careful keeping. Butter is a delicate article, and its worth is largely in its life and freshness, its flavor and aroma, and these gone its value has gone also. It is like a bouquet, when the young man bought it and presented it, fresh and fragrant, it was the toy of lily fingers, and cherished and admired; but in a day or two afterward, when the girl brooms it out off the back stoop among the rubbish, its value has departed, it's a bunch of worthlessness. And so with butter. There may be the best farm, and the best stock, the most patient and faithful dairymaker, but if there is a cellar under the house where flies buzz in summer, or with a wet, mud hole bottom and mouldy smell, then the best work above stairs may all go for naught. Concentration in selling is facilitated by the factories, and furthered by the local markets at the focal points of the different districts. The four corners, with its church, artizan shops, stores and tavern, concentrates the activities of a neighborhood, the same as the burning glass brings together the rays of the sun and generates heat and warmth. Men feel the influence of its attraction, and unless there is counter attraction to keep them in their own home orbit, tend to the nearest centers and from thence to the city, as naturally as rivers run to the sea.

So too with the product, it seeks concentration and inclines to a common center for distribution and exchange. The larger the market the more powerful the attraction, and the nearer the market the more powerfully that attraction is exerted. London, and Liverpool, and Manchester would suck in the products of these northern counties like water going through a mill race, were there not 3,000 miles be-

tween us and them. New York, Boston and Philadelphia being nearer are stronger magnets, each attracting a greater or less proportion of the product in ratio to their own accessibility, and bulk and volume of business, while Utica and other near-by markets exercise that contagious home attraction, which will become more extended and powerful as intercommunication is developed and cheapened, and as the standard of quality becomes uniform and advanced, and as the regular concentration of quantity at these different markets becomes more fully assured. It is to these local markets, to the freest, cheapest and best facilities for the exchanges of production and the most mobile association of men through the open country, that we must look for the greatest good to the greatest number. Keep these focal distributing centers widely known, alive with offerings and of high character for justice and generosity, so that all the world may know, and knowing, come to buy, as friends to friends, liberal buyers to a generous market. Keep the country attractive, populous and popular, and the best interests of the cities will be assured. When men die, it is the extremities that first get cold—when they are in debauch, it is the head and heart, the centers of the system, that are flushed and fevered, and when farm-houses drop into coldness and neglect, when tenants take the place of proprietors, when the country school-houses are deserted and the cheery voices of children are dying out from the hill sides and the valleys; when cities are crowded and overgrown, and riotous speculations usurp patient industry and rule the hour, when political and commercial centers are hot with excitement, when costly public buildings and public officials are increasing in direct ratio with poverty and pauperism and crime—we must then suspect the flush of fever rather than the glow of health. Consequent upon marketing comes the rapid, certain and economical transportation, the means for which have been vouchsafed us by the Giver of all good, (but as yet only partly laid hold of and improved). The use of the telegraph should make the commercial letter obsolete, and railroads and telegraphs whose stock and cost shall only be represented by actual cost, will one day give us the further benefits sought to have been conferred by the good Father upon his children through the patient workings and untiring genius of a Fulton and a Morse. More remote from marketing interests, but not less vital to their prosperity, lie the general health and well-being of society at large. The strength and vigor of all our individual interests lie in the health and vigor of society as a whole. The branch cannot flourish without the absorbent root and the sustaining trunk, and we must not only canvass our particular branch of business, but also its relation to, and the condition of the organisms of which it is a part.

The earth, take the world over, is almost as free to the uses of man as the air he breathes. Its acres are broad and plenty, and the farmer's vocation is open and free to all. It requires no legislative enactments to limit the thrust of the spade or the length of the furrow, and no so-called protective societies to strangle apprentices to the plow or to regulate the hours of the sun—in his domain competition is open and free to all.

He doesn't want national legislation, compelling paper as a legal tender in place of the world-recognized standard of gold and silver, and reducing the business of the country to the level of the policy

shops and gaming table, with his own trusted agent, highest in power, howled at as arbiters of the game.

In fact, he sees only damage and destruction in the whole outfit of special legislative tinkers, with their wholesale uses of soft solder, followed by the red-hot iron of application.

Railroads and canals and telegraphs are made legislative shuttle-cocks, money is converted into a bewitched devil broth, currency without redemption, hampered by many laws, all departments are more or less in the hands of speculators. There have been no less than three different State acts regulating the tare of the packages in which butter must be packed, the last one passing the Legislature in the winter of 1864-5, just as the light-headedness of the great greenback era had commenced. Its title should have been: "This is an act entitled an act to take away the right of a dairyman to weigh and mark his own package containing his own butter, and to appoint the coopers of the State to transact his business in his stead."

Were merchants and mechanics, lawyers and politicians and other babes and sucklings so gored and sore wounded by ye savage agriculturist, that they had to appeal to the sovereign arm of the State for the balm of a special law with an army of unpaid coopers to back it? No. Our brethren in other industries had no wish to manacle honest labor, as if it were a suspected thief. The insult had not the warrant of even a mistaken public opinion, and the law is but a specimen of the other lawful lies, begotten by the devil, whose children are choking truth out of the statute book, and we shall be not only negligent and guilty, but traitors to ourselves and to our homes, if we permit such interferences with the private interest, without protest and all possible counter effort. Ah! the old admonition of the fathers, "Let freedom ring," that music that calls all men into activity, subject only to general laws. A running chart issued for the guide of all—that old silver-toned bell ringing out freedom to all, favoritism, placeism and pauperism to none; its chimes have wooed the laborer to his task, cheered him on life's journey, and soothed him to his rest, in the fond hope that its tones shall ring out again on the clear air of heaven for his children and his children's children. Across the sea its echoes have awakened the peoples of distant lands, and brought them hither, willing workmen at its call. And this it is that has given us great measure of prosperity; this it is that has given the American dairyman, in common with the American artisan and the American laborer, the best market to go to on earth. We have not been feeding or working for paupers who cannot buy, or for paupers officially suckling their support from the State who can—but we have been dealing with, and serving and supplying as co-laborers, farmers—men of greater individuality, more personal activity, and hence larger consumers of a higher standard of produce than any other people under the sun, and it is no more a political or a social question than it is a square business proposition whether we shall sustain these markets in the full flush and vigor of health with the free action and unfettered intermovement of all parts of the body politic, or whether they shall be left to become entangled in conflicting laws, and hamstrung by special legislation. The interest of one is the interest of the whole. The artisan and labor, capital and money, are all members of the same household; their prosperity is our prosperity, their ability to buy is our ability to make sales, and any injury to them is a loss to us. Let us then extend the right hand of fellowship to

our brethren and workmen in all the various channels of industry, and work and pray for their freest play and fullest movement, and with all our hearts bid them a prosperous and happy new year and a continued growth and advancement.

The chair announced the following committees :

On Vienna Exhibition—David H. Burrell, of Herkimer; X. A. Willard, of Herkimer; Harvey Farrington, of Canada West; M. Folsom, of New York.

On Centennial Exhibition—J. V. H. Scoville, of Oneida; O. S. Bliss, of Vermont; D. A. Nichols, of Chautauqua; David W. Lewis, of New York; E. S. Munson, of Delaware.

O. S. BLISS'S PAPER.

O. S. Bliss, Esq., of Vermont, read the following paper on "The Butter Factory system of Northern New York":

Mr. President: After the very eloquent and poetical address of the gentleman who has preceded me, I fear I shall make but a sorry show in the presentation of my sober matter of fact remarks upon the subject of recent improvements in butter-making in Northern New York. I cannot, moreover, but feel that somewhat of apology is due from me for appearing before you as the special chronicler of the progress of the people of a portion of your own State, in that department of industry which it is our object as an organization to foster. So confident, however, am I that the intrinsic merits of the case will justify my action, that I beg your indulgence for a very few minutes while I attempt very briefly to indicate some of the more important elements of their success.

Not many months ago I was looking about among the butter dealers of Boston, when I accidentally run upon one who was just receiving a load of butter from a factory in Franklin county, New York, a section to which we of Northern Vermont are united by a variety of ties, and in which we contrive to keep up a pretty active interest. I found the dealer courteous and communicative. We examined the butter together, and he gave me such information in relation to it as he possessed. I found it a very choice product, such as is rarely seen upon the wholesale market in any city—such as is usually gobbled up by a certain class of dealers the moment it touches the consignee's floor. In fact, of that class of goods which is always spoken for in advance. Every dealer who is so fortunate as to get such a lot has a place ready for it. It was perfectly uniform in style and quality—so alike, that to use a cant expression, "you could not tell one package from the other."

Soon after that I spent a day among the butter dealers of New York, and I examined a great many packages of choice butter there, but I am free to say that I did not in any instance see a finer lot than that from Franklin county. Before leaving the city I opened a correspondence upon the subject with some of my friends at Malone, and subsequently visited the locality for the purpose of learning more of what was being done there in the way of making a really choice article of butter. I had known something of the products of that section for many years, and I was prepared to find that an advance had been made in many particulars, but with an ever-abiding sense of the tenacity with which old customs and prejudices stick, I was surprised to learn that they

had for once capitulated, and that a new and better way was prevailing to an extent hardly to be credited.

I think there is no stimulus to improvement like an honest discrimination on the part of the buyer between the different grades of goods. But the ordinary system of buying butter in all our country markets has not been sufficiently discriminating to have a thoroughly good effect. It has generally been slack and spasmodic, and has failed to impress the fact upon the mind of the producer of the common "fair to good" article that his goods are not up to the standard of excellence that will command the best price. The producers themselves do not, and I am charitable enough to think that they cannot, ordinarily, discriminate sufficiently for their own interest in this matter.

Human nature is always and everywhere perverse. It is a waste of time and breath, to attempt to talk men into a better course of doing their work, be it in the dairy or on the farm. It is not enough for them to hear of, or to see the defects in their products. You must make them feel that their interests are to be promoted before you can induce any reformatory action. Many a man may date his prosperity back to a transaction exceedingly damaging to his purse, but equally or more mortifying to his feelings. The buyer who, without appearing hypercritical, candidly and fairly tells the producer that his goods are not what they should be, nor what he can make them if he will, does that man a greater favor than he who, fearing to offend and lose a customer, takes some round-about course to get "whole" after making an undesirable purchase from him. What is true of individuals is equally or more so of communities. A community that has acquired a reputation for the production of a superior class of products is not half so apt to seek for and embrace improved methods of production as one that has heretofore occupied a less desirable reputation in commercial circles, hence we may always look for the most valuable improvement—for the most zeal and enthusiasm—in the less favored localities. Most men have a healthy ambition in relation to such matters when they once come to appreciate their real position. I would not be understood—to so much as insinuate—that Northeastern New York or its people are lacking for any of the elements that go to make up a successful dairy country, but the fact exists nevertheless, that they have not in the past, been so situated as to command so favorable prices in comparison with other localities as the people believed they were entitled to, and they set vigorously to work to remedy the evil, and right thoroughly have they accomplished their purpose. I do not mean to say that there is no second or third quality butter produced there at this time, but I do say, and I have the figures to sustain me, that the sales of the past year indicate a progress in that respect, without a parallel in the circle of my acquaintance. Their butter is no longer a drug upon their hands, but notwithstanding the low prices and comparative dullness which have characterized the market the past season, there has not been a time when there was not a demand for all their choice goods in advance of production, and at prices quite in advance of those which were paid in localities which heretofore have outsold them by several cents on a pound.

And now arises the question, in what manner have these very cheering results been accomplished? We answer, chiefly, but not altogether, by adopting the co-operative system and working up the milk in factories.

At a meeting held in Malone, for the purpose of organizing a county dairymen's association, which I had the honor of attending some weeks since, it was remarked by an enthusiastic factoryman, that no butter had been sold in that place for over thirty cents a pound that was not made in a factory. Such, however, was not the case, as subsequently appeared: but the additional facts also appeared that the exceptional private dairies had all adopted precisely the same apparatus and process of manufacture employed in the factories.

It has been said by some wiseacre that the popular adages might better be called popular fallacies, and to illustrate his position he produced a whistle which he had made from a pig's tail. He might here find another opportunity for an equally apt illustration of his position, for the Jewett pan, the invention of a Franklin county dairyman, and manufactured by a Franklin county tinsmith, is used here, not only in all the factories but in very many private dairies, and I have failed to meet a man who having once adopted it has gone back upon it, and a man for once, the popular adage to the contrary notwithstanding, is honored in his own country and among his own kin.

At this point I may be permitted to offer a word of personal explanation. Two years ago I had the honor to read a paper before this association on the subject of butter-making, and I then took occasion to commend a style of pan which I knew to be in successful use, and today, with equal stress, I commend another which I know to be in successful use. Of the former, there are to my knowledge four or five sets in use; of the latter, I have little absolute knowledge, but I presume there are half as many thousand—there are certainly in the small circle of my personal acquaintance half as many hundred. The one is based upon the theory of deep setting, the other upon that of shallow setting. The friends of each claim it to be superior to the other, but I do not know that the question has ever been tested by experiment. I have never made any tests by which to fully settle in my own mind the relative merits of deep and shallow setting. I did, however, accept the reports of experiments by others, which I at one time believed conclusive in favor of deep setting. During the past two years, several reports of experiments have been published, one of the most reliable of which is that of your secretary, alluded to last evening, and nearly all of which tend to sustain the theory of shallow setting. It is a question, however, which must require before a trustworthy conclusion can be reached, much time, great care, more apparatus than any small farmer or dairyman has at command, and a large supply of milk for more than one milking or one day.

Our Vermont Dairymen's Association has authorized its officers to conduct such an experiment whenever we can find a dairyman or a factoryman who, having the facilities, is willing to co-operate with us in making the experiment, and we expect to be able to reach some positive conclusion of the whole matter. Until that question can be settled by more thorough experiments than I have ever seen recorded, I shall deem it prudent to adhere to the old-fashioned practice of shallow setting. Whenever it shall be fully established that deep setting affords as favorable results, I shall again advocate that as most convenient, regardless of anybody's charge of vacillation or fickleness. I am not here to commend or condemn any man's goods, wares or merchandise. I disclaim *in toto* any attempt to grind anybody's axe, or even to whet anybody's little hatchet. But I may be permitted to say

in this connection, that of all the cooling pans for shallow setting that I have ever seen, I think Jewett's, in at least one respect, very much to be preferred; and that is, in the manner of constructing the water attachment, whereby a constant flow of the water is kept up under every part of the pan, however small the supply. Cooling from the bottom is at least unphilosophical and where a pan is set into a broad tank unless the supply of water is very large and the flow in a full sheet clear across the tank, some portions of the milk are cooled more rapidly than others, thus creating an undesirable motion among the particles of the milk. Another benefit of this construction is the rigid firmness thus given the pan, which keeps it always up in good and true shape, without any sagging or bulging.

Apart from the method of setting the milk and the most rigid cleanliness in everything, I do not know of any peculiarity of practices among these factories. The churns in use are of several kinds, and do not constitute a peculiar feature of the system. It was my intention to present for your consideration some statistics of the operation of the several factories in Franklin and adjacent counties, but not being upon the ground myself, I have been unable to procure any considerable number. I need not remind you that such reports as are desirable for the purpose are generally furnished with reluctance. I could never understand just why it is so; sometimes I think it mere apathy, and again I think dairymen, and especially factorymen, shrink from comparisons which may not be favorable to them. Of all false pride, I think this most unreasonable and unwarranted. Without knowledge of where we stand, we cannot possibly hope for improvement, and he who this year, for some reason which may not appear to him, may be compelled to make an unfavorable showing, may, by that very circumstance, be enabled to remedy his faulty practice next year. Although we have made immense strides in the way of improvement during the last ten or twenty years, yet we have only begun. I do not know that there is any one fact in relation to this great enterprise, in which we are interested, which is fully established, unless it be the fact that we do not yet know the first rudiments of the science, that we have not yet got out of that chaotic condition and into one where our opinions have begun to crystallize and take on the regular form of principles.

It is a great fallacy to suppose that we need only reports of successful experiments upon which to build up a system. If we have run upon a shoal or reef, it is as much our duty to place a buoy over it to warn others off, as to point out a safe harbor for anchorage for them.

It is the sum of all our experiences, good, bad and indifferent, which gives value to our reports.

Of the fifteen factories or more in that section, only five have sent me reports. From these I condense the following facts:

FACTORY REPORTS.

BERRY FACTORY, MALONE.

Whole number of pounds of milk.....	721,312
“ “ “ butter.....	29,722
“ “ “ milk of one butter.....	24 26-100
Price at factory {summer.....	30½ cents
{fall.....	37

UNION FACTORY, BANGOR.

Milk, pounds.....	265,184	
Butter, pounds.....	10,904	
Pounds of Milk to one of butter..		22-3
Butter contracted in the early summer at 30 cents for the season.		

BURNOP FACTORY, MOIRA.

Milk, pounds.....	340,635	
Butter, pounds.....	14,894	
Milk for one pound of butter.....		22-37
Butter sold at factory for.....		37 cents

BARLEY SPRING FACTORY.

Milk, pounds.....	487,710	
Butter, pounds.....	21,518 $\frac{1}{2}$	
Milk for one pound of butter.....		22 61-100
Price of butter.....		30 85-100
Cost of manufacture.....		4

The president of the St. Lawrence County Dairymen's Association writes me under a recent date: "As to the butter-making in this section I can say that the average quality has been better than last season, especially so during the fall. July, August and September gives us much very hot weather, and, unless dairymen had facilities for controlling the temperature, their products were very poor and sold as low as 10 to 20 cents. There have been some eight or ten sets of Jewett's pans in use in this vicinity and they are giving good satisfaction. Where they have plenty of water to use with them the product has been good, and I think the Jewett pan, or perhaps some improvement upon it, will enter largely into use here as our dairymen are able to obtain them. As a butter dealer I should be glad to have all the milk worked up in factories so as to get a uniformly good article. I fear, however, that the lack of running water, the trouble of hauling milk, and many other difficulties, will prevent a large share of it from being worked in that way."

Mr. Scoville—Mr. Bliss, is it customary to deliver milk twice a day at a butter factory?

Mr. Bliss—I cannot see how it can be otherwise. You will see that all the factories I mention are small, and hence can be run economically, cleanliness and order being the main essentials to the conducting of one.

Mr. Harris Lewis—There are many modest farmers here. To accommodate them we have here a "Question Box." Any question that one wishes to ask may be put in here. The questions will be read at the beginning of each session.

A member—Does it not require more skill in the manufacture of butter than it does cheese?

Mr. Bliss—I think it requires more care.

Another member—What is the price paid for making butter at those factories?

Mr. Bliss—Four cents a pound.

Mr. Hawley, of Onondaga—I think the great secret in butter making is the proper keeping of it before marketing. There is not so much trouble in making it as in making cheese. Keep it in a cool place and apart from dirt and decaying vegetable matter, and your butter will be all right, that is if the feed is good.

Mr. Scoville—Must a butter factory be located on a stream of water or near a good well?

Mr. Bliss—On streams principally, but often near good wells or springs. There are many springs in Franklin county on which butter factories are located.

Mr. Ellison, of Herkimer—I do not believe that it is the business of a dairyman to give assent to everything that is presented to him here. Good soil and water are essential to the good making of butter and cheese, and these should govern his acceptance of suggestions and advice.

Mr. Bliss—I do not say that good butter can be made everywhere, but, where good beef and good cheese can be made, good butter can be made. I wish to say a little about Orange county butter. A great deal of so-called Orange county butter comes from Vermont and Northern New York.

Mr. Ellison—I believe in the good quality of that butter, however, when it is genuine; for the feed there and in Delaware county does make the best butter.

Mr. Moon—What do they do with the milk at these butter factories after it is skimmed?

Mr. Bliss—They feed it out, I believe.

Mr. Hawley—I believe the breed of cattle determines whether it is better to make butter or cheese from the milk. Some make good cheese, but inferior butter, and some *vice versa*.

Mr. Chapman, of Madison—As I understand Mr. Bliss, he says that there is as much skill required in a butter as in a cheese factory, but it requires more of these skilled hands in a cheese factory, the question being merely one of numbers. I think that the soil and climate affects the quality of cheese. I do not know so much about butter. The difficulty in making a good quality of cheese depends more upon the patron than the factoryman. There are men who will not believe you when you tell them that what a cow eats and drinks affects her milk. The result is the factoryman is bothered all summer with floating curds. I would like to ask if skimming milk prevents these floating curds; also, if butter would be affected when made from milk that produces floating curds?

The gentleman's question remained unanswered on account of an adjournment until 2 o'clock.

AFTERNOON SESSION.

The court-house was full in the afternoon, many ladies being among those present. The convention was called to order at a quarter after two o'clock.

QUESTION BOX OPENED.

The Question Box was opened. The first question was, "Is there any other use for buttermilk other than feeding it to hogs and calves?" Laid on the table.

"Is it beneficial to rinse curd with cold water?"

Mr. Chapman of Madison—The only object is to prevent the formation of acid. I have used a great deal of cold water for this purpose. This prevents the formation of glass curds.

Mr. Bonfoy—I should recommend warm water.

The next question was, "Can cream, once separated from the milk, be worked back into cheese?"

Mr. Harris Lewis—I have supposed that cream once separated from the milk could not be worked back into cheese. I have tried to work it back for years, but failed. If the cream is to be made into whey butter on its way to the hog pen, it should be arrested sooner and made into palatable butter. If it will waste, let us skim the milk in the vats.

Mr. Wright, of Oneida—The question seems to be discussed under the supposition that the cream be allowed to rise on the milk. I do not let it rise to any appreciable extent. I prevent it by an agitation. If you take two vats, and skim one and make butter of the cream and leave the other unskimmed, you will find the unskimmed cheese to weigh as much as both the skimmed cheese and the butter together. By skimming the cheese, you will depreciate its quality, inasmuch as you lessen the quantity. This skimming is becoming too extensive among American dairymen. American cheese brings lower prices in foreign markets, in consequence. I believe it for the interest of dairymen, therefore, not to skim. Whether you skim or not, there will be more or less buttery particles that go into the whey. As to the question discussed this morning, concerning the relative skill in the manufacture of butter and cheese, I would say that any one, with good senses and rules, can make butter or cheese equally as well.

Mr. Curtis—I think that the discussion has wandered from the question. The point is, "Can cream, after it has once separated from the milk, be made into cheese?" I don't think it ever can. You can mix it mechanically, however. This is assisted by agitation. I have found that there are no more pounds of product made by skimming than by not skimming. I have statistics to prove this.

Mr. Moon--If we confine ourselves to the question, it seems to me it is a narrow one. I shall discuss the prevention, therefore, instead of the cure. What has caused the doubling of the production and of the prices of the American cheese in the last few years? The improved quality has increased the demand. This quality is only kept up by not skimming the milk; for certainly unskimmed cheese brings higher prices.

ANNUAL ADDRESS.

The annual address was then delivered by L. B. Arnold, Esq., of Rochester, N. Y. His subject was "Words to American Dairymen and Cheese-makers."

After the close, a vote of thanks was given to Mr. Arnold for his able address.

REPORT OF COMMITTEE ON FINANCE.

Your committee would respectfully report that they have carefully examined the accounts and vouchers of the treasurer and find them correct. The financial condition of the society is not as encouraging as your committee would be glad to report.

There are bills now against the association of	£329.67
The estimated necessary expenses for the current year, including one paid lecture	100.00
Salary of secretary.....	200.00
Expenses of the convention	60.00
Also for printing reports, &c.....	300.00
Are.....	660.00
Making with arrears and expenses one year.....	£959.67
To meet these expenditures we have only the receipts for membership, sale of reports, and advertising, say.....	£500.00
Leaving a deficit at the end of the year of.....	£459.67

The estimated receipts and expenses of course are not positive, but near enough to show that the expenses are far in excess of the receipts. All of which is respectfully submitted.

WM. BLANDING,
E. EMERSON,
Committee.

The committee on nominations reported the following :

President, Hon. Horatio Seymour, of Oneida county; Vice-Presidents, Hon. T. G. Alvord, of Onondaga; Hon. X. A. Willard, of Herkimer; T. D. Curtis, of Oneida; O. S. Bliss, of Vermont; Ashal Bunham, of Chautauqua; David W. Lewis, of New York city; C. E. Chadwick, of Canada; Alexander McAdam, of Montgomery; S. Favile, of Wisconsin; G. B. Weeks, of Onondaga; Wm. Blanding, of Broome; S. R. Townsend, of Franklin; David Hamlin, of Jefferson; Gen. B. F. Bruce, of Madison; L. R. Smith, of Erie; H. Farrington, of Canada; J. Lewis, of Cattaragus; E. N. Southworth, of St. Lawrence; E. S. Munson, of Delaware; J. M. Walden, of Minnesota; Dr. L. L. Wight, of Oneida; W. A. Johnson, of Erie; S. Straight, of Ohio; A. B. La Mont, of Tompkins; Secretary, L. B. Arnold, of Rochester; Treasurer, Harris Lewis, of Herkimer.

S. A. FARRINGTON,
D. H. BURRELL,
CHARLES C. HOUSE,
WM. A. JOHNSON,
L. T. HAWLEY,
Committee.

Mr. Bliss, of Vermont, extended an invitation, in behalf of the Dairymen's Association of that state, to be present at its convention, at St. Albans, next week.

Mr. Curtis offered the following resolutions on the death of J. B. Lyman, the deceased agricultural editor of the New York *Tribune* :

WHEREAS, An all-wise Providence, has seen fit, for reasons not apparent to our finite wisdom, to remove from our midst, our friend, associate and co-worker, J. B. Lyman, in the prime of his manhood, and when to us he gave great promise of a long life and future usefulness; therefore

Resolved, That we bow to the irreversible decree with becoming submission, while we bear testimony to the manly virtues and noble traits of the character of the deceased; and that we willingly assume, as a duty, the additional burdens laid on us by the loss of our assistant, and will labor earnestly and perseveringly to push forward the good work in which we were mutually interested and engaged.

Resolved, That to the bereaved wife and family we extend our most cordial sympathies, trusting that the God "who tempers the wind to the shorn lamb," notes the sparrow's fall and numbers the very hairs of our heads, will open to them a means of abundant support and grant them many long and useful days of health and happiness.

Mr. Hawley, of Onondaga—I trust we shall hear more from those of this association of the character and ability of Mr. Lyman.

Mr. Harris Lewis—Mr. Lyman's character can be expressed in a few words. Those who knew him best loved him most.

Hon. X. A. Willard, of Herkimer, read the following paper and resolutions :

MR. X. A. WILLARD'S ADDRESS ON A MEMORIAL FUND FOR JESSE WILLIAMS.

It is now about 20 years since Jesse Williams inaugurated his system of cheese factories and associated dairying.

The system as is well known has steadily gained in public favor and is gradually being adopted by the nations of Europe. But since it has proved a success, European writers are not wanting who seek to deprive Mr. Williams of due credit in this matter, claiming that he borrowed his system from Switzerland. It is true, associated dairying under a certain form had been practiced by the Swiss previous to that inaugurated by Mr. Williams, but Mr. Williams' factories in all their details of machinery and appliances were essentially different from those in Switzerland, and except in the matter of several persons joining together to have the milk of their cows made up at one place, the Swiss and American systems are quite different.

We have undoubted authority for stating that Mr. Williams had not even *heard* of the Swiss association at the time he planned and erected the first American factory, and he undoubtedly was sole inventor and originator of what is known as the American factory-system of dairying. To him we are indebted for this system of associated dairies, one of the most remarkable steps in the history of progressive farming that has been taken in this wonderful age of new ideas. Of its beneficent results, we can now scarcely form a correct estimate. The system was eminently his own. He lived to see shoots from the parent factory spring up rapidly about him, and spread their vigorous roots deeply through all the land; and wherever cheese-dairying shall be known in after time, his name should be inseparably connected with its progress and success. His was no narrow and contracted spirit, that sought to hide and cover up the mysteries of his art for personal aggrandizement. He gave of his knowledge freely to all who came. He suggested improvements and advised gratuitously, so that others might steer clear of difficulties which had beset him, and which had only been conquered after years of trial and toil. Through his creative genius, Oneida county sprang at once to the head of the great dairy interest of the state; through him millions have been added to the permanent wealth of the country; and yet modest and unassuming, he claimed none of the honors pertaining to a splendid achievement and a grand success. Born and reared on a farm, farming was a profession which he ennobled. As a good citizen, he identified himself with the interests of his town and county, and whenever a worthy object could be promoted by his assistance, earnest and active co-operation on his part was not wanting.

His indomitable will and energy overcame obstacles that seemed formidable to other men, and whatever he put his hand to do, he accomplished. Not an aspirant of fame or the world's empty honors, he but sought to do the work assigned him with cheerfulness and Christian fortitude. He reached "the end," leaving behind a long record of shining virtues, which the great in power and station might well copy as a legacy.

One most remarkable feature connected with the inventions of Mr. Williams, is that he took out no patents and claimed no royalty on any of his cheese-making devices and improvements. He could have laid a heavy embargo upon the cheese factories of America by taking out patents, thus accumulating an immense fortune for himself, but he preferred to give his inventions to the public, and leave to the world such acknowledgment as it saw fit to offer him. The time has come, it seems to me, when the dairy interest of America should make some suitable recognition for the great benefits received from Mr. Williams.

Mr. Williams is dead, but what shall be a suitable monument to his memory? It is customary, in this age, to erect statues of bronze or marble in the parks and public squares of our cities, in honor of distinguished public benefactors. It is emblematic, in some sense, of the appreciation in which a grateful people hold the memory of those who have given to the world great benefactions.

But a monument for Mr. Williams, it seems to me, should be of a different character, and one more in accordance with the principles which guided his life in respect to the diffusion of knowledge. There are now a thousand factories in New York, and not far from two thousand in America. A fund of \$10,000 could be easily raised by five dollars from factories and one dollar from each dairyman. Cannot this fund be raised and permanently invested, for scholarships in Cornell University or Hamilton College for the education of poor but worthy young men? Let it be known as the "Dairymen's Memorial Fund," contributed by dairymen in grateful remembrance of one who has been the means of enriching thousands, asking nothing for himself. Thus shall we perpetuate his memory in a laudable way, and carry out Mr. Williams' plan of helping those who need help, and of giving knowledge freely to those who seek it diligently. As a son of Oneida county, it seems eminently proper that his name should be in some way connected with Oneida's great seat of learning. Learning is more enduring than bronze or marble. Mr. Williams was, in a certain sense, an educator of the people. Cannot we associate his name with learning in its broadest and highest aspects, and show to the world that the dairymen of America have a due appreciation of the American factory system? Therefore

Resolved. That the proprietors and managers of cheese factories and the dairymen of America be solicited to make up a fund of \$10,000, as a memorial fund for Jesse Williams; that the treasurer of this society and P. V. Rogers, of the First National Bank in the city of Utica, be designated as the persons to receive contributions; that such contributions shall from time to time be paid over to the trustees of Hamilton College, and by them to be permanently invested and the interest of the same only to be used in such way as may best promote the object of education, under the direction of the society.

Mr. H. Farrington, of Canada, warmly approved the resolution and delivered considerable of an eulogy upon Mr. Williams.

Mr. Moon, of Herkimer, also earnestly desired the adoption of the resolution.

The resolution of Mr. Willard was adopted.

Mr. Weeks—I have had it cast into my teeth, time and time again, that the list of factories in our report contains many that do not exist. I could not help that; and I wish that every factoryman on his

return home would send the name of his factory to Mr. Arnold, my successor, so as to avoid future trouble in the matter.

The secretary read the following resolution, presented in connection with the report of the finance committee:

WHEREAS, This association, by its annual meetings, publications and lectures, have done and are doing more to elevate the standard of agriculture in all its branches, than any other organization in the state; disseminating experimental results to every town and county within and even beyond its limits; therefore

Resolved, That the Legislature of the state of New York should aid these efforts by an appropriation of not less than \$500, to enable this association to carry out more fully its designs of improvement, in one of the most important and useful industries of the state.

Resolved, That a committee of three be appointed to present this subject to the attention of our Legislature, and solicit the appropriation of a sum commensurate with the necessities and interests of citizens, and worthy the dignity of a great commonwealth.

Considerable discussion occurred as to whether this subject should be presented to the State or United States government, as this association was an United States affair. An amendment to that effect was passed and then the resolution as amended was also passed.

A vote of thanks was returned to the retiring officers, and especially to Mr. Weeks for the excellent manner in which he had filled the office of secretary of the association. The vote was a rising one and was unanimous.

Mr. Weeks thanked the association for its cordial vote of thanks. He said that he had held the office for seven years and when it was again tendered to him he declined, because he thought he had earned a respite.

Mr. Arnold made a short speech of acceptance on taking the office vacated by Mr. Weeks.

A motion was carried that the association instruct different county organizations throughout the United States that they send respective lists of factories to Mr. Arnold, so that the next secretary's report may be correct.

Mr. W. F. Durgin, of the Boston *Advertiser* addressed the convention on the necessity of dairymen having a better knowledge of the markets.

The convention adjourned until 9 o'clock Thursday morning.

LAST DAY.

The Dairymen's Convention began its last day's proceedings at half-past nine o'clock Thursday morning.

The convention was called to order at 10 o'clock, Hon. X. A. Willard in the chair.

The following resolutions, offered by Mr. J. V. H. Scoville, were passed:

Resolved, That when the convention adjourns, it adjourns to meet at the city of Utica, on the second Tuesday of January, 1874, and continue in session for three days.

Resolved, That, as members of this convention, we desire to express to the several firms and to the citizens of this city, as also to Messrs. Proctor and Chamberlain, our appreciation of their generosity for the elegant banquet provided us, at Baggs' Hotel, last evening.

Mr William Blanding, of Broome county, read the following paper:

THE ADVANTAGE OF SKIMMING THE NIGHT'S MILK.

Mr. President and Members of the Convention :—The magnitude of the dairying interest in the United States, with its enormous investment of capital and outlay of labor and material in the manufacture; the drain upon the product in reaching the market, and the various diseases to which the herds are subject of late; all conspire to urge upon the mind of the intelligent and thinking dairyman the need of economy in all branches of his business; from the best and cheapest fertilizers for the fields, to the most convenient and profitable package for his butter and cheese. He must be ever vigilant to close all the avenues, where waste may go out; lest want may come in at the same door. It is perhaps from this very necessity of things that the farmer, the patron of the factory and the manufacturer himself, should investigate each particular branch of their calling and bring the same to the highest possible perfection. It may be pertinent in this connection to ask the question, is all the cream in the milk utilized and retained in the cheese to the best advantage by the usual plan of manufacture. This question has been considered of sufficient importance to attract the attention and experiment of some of our most practical dairymen, the results of whose experience we hope to learn in this convention. My opportunity may not have been as extended or as full as that of many of those present, but such as my experience is, it is at the service of this association; believing that in the discussion of the subject I shall receive more knowledge than I can impart. The premises which I will assume, for the correctness of which I will appeal to the experience of every cheese-maker here, is: First, The cream when once separated from the milk cannot all be retained in the cheese, but in the making and manipulation of the curds, in a measure or to a certain extent, pass off in whey. Second, The good quality of fine cheese is not wholly dependent on the butyraceous quality of the milk. The great bulk of American cheese found faulty, in the foreign markets, is not condemned for want of richness, but more generally in consequence of bad flavor and early decay. Accepting these premises and statements as facts, it would seem that manufacturers should give special attention to the manufacture and curing of their goods more than to a continual and persistent effort to work into the cheese an excess of cream, which by chemical laws refuses to unite and become incorporated with it. I have seen cheese made from partially skimmed milk, that in all appearance was richer than other made from milk not skimmed at all; and the conclusion is forced upon my mind that there are subtle influences in operation in the manufacture of cheese that do or might conduce to the softness and richness of the product, not wholly dependent on the butter contained in it. Another reason substantiating the same conclusion is the fact established by analyses, that the best make of English cheese is not as rich in butter as our American product. There are two sources by which we suffer loss in the making and handling of curds. First, failure of the rennet to coagulate the particles of cream or butter once separated from the milk; in which case it is left to float in and pass off in the whey. The extent of this wastage depends upon the perfectness of coagulation. And that it is ever perfect in its action upon *new* milk, I very

much doubt ; while upon milk when a portion of the cream has been separated, the difficulties of a *perfect union* are very much increased. Second, the action of the acid upon the curd before it is freed from the whey, (accepting the theory to be correct that lactic acid to a certain extent should be developed in whey before dipping the curd, and that this is a necessary condition in the make and maturing of good cheese;) yet there is another effect upon the curd, which is not so desirable, and that is to lessen the weight and impoverish it also in quality. The action of this acid upon the particles of curd is similar to that of alcohol upon gums, cutting, or reducing them to a liquid form. Its action being upon the surface, if the curd is fine and kept in agitation, or floating in the whey, a larger surface is exposed to the influence of the acid, and in proportion a larger waste is suffered than when the curds are coarse, or packed in solid mass in the vat. As the oily or buttery portion of the curds yield most readily to the dissolving influence of the acid, it follows that the loss from this cause is the richer portion of the cheese. These two causes alone are of serious magnitude in the aggregate, and are a drain upon the profits of the dairying interest larger than is generally imagined. But how shall this waste be avoided? is a question of importance, but not so easily answered. In our business as manufacturers we note the result of the various operations and changes as they progress; but these very operations are subject to chemical laws, of which we are almost totally ignorant. Science has opened her doors, by her learned professors, and is doing more and more each year to give knowledge in our branch of business; and yet with all these aids, I confess myself groping in the dark, dealing with laws and subtle agencies of nature, of which I know next to nothing. And if you ask why the cream cannot be all worked into the cheese, I can only answer I wish I could tell. I see two plants of the same species, whose roots furnish sustenance from the same soil, whose leaves breathe the same atmosphere; and one bears a blossom of purest white, the other one of the most beautiful crimson. How nature brings forth the delicate tint on the one, and pure snow white to grace the other, I know not, but leave it with those who search the deep labyrinths of nature's laws, to determine.

The result of my observation and experience I will give freely, hoping the members will discriminate between that which is practical and that which is not. I believe a sufficient development of acid may be obtained, with less loss to the curds, by McAdam's process, called the Cheddar plan; keeping the curd floating during the cooking, and letting it settle and pack with but little whey, as it awaits the development of the acid, when it is thoroughly drained, ground and salted for the press. In this way but little surface, comparatively, is exposed to the action of the acid, thereby increasing the *quantity* of cheese, over the more common mode of Cheshire style. The cream that separates on the night's milk may be carefully removed in the morning—the morning's added and made in the same manner as if no cream had been taken off. In some of our factories the night's milk is strained into the cheese vats and cold water circulated around the milk till morning. In other cases we strain the night's milk into coolers which are set in pools of water over night; after removing the cream, which must always be done with care, (to guard against agitation), this milk, together with the morning's mess, goes into the cheese vat to be worked up. It is our object and determination to make the very best

goods we can, as I believe it is of every manufacturer here to-day. Our goods have given good satisfaction in the markets where they are used and command full and remunerative prices when coming in competition with what is called full milk cheese. If every pound of choice butter made from the cream thus taken could be evenly distributed through the cheese, the consumer would secure its benefits as food at least. But if it may go to the swill vat for the swine, or otherwise to the market as a choice and desirable article of food, for which the highest prices are willingly paid, then I say it is our duty to so make and dispose of it as to secure the greatest possible profits, and avoid a waste of any portion of that food so kindly furnished and so wisely adapted to the wants of the human family. There is a loss in the weight of cheese from the whole pounds of about 10 per cent. and a gain in butter of from 20 per cent. to 25 per cent., or a net saving of 10 per cent. to 15 per cent. Taking the product of cheese in the United States to be two hundred millions pounds per year, a gain of 10 per cent. would be equal to twenty million pounds, or its equivalent in value, or say an annual saving of two million dollars. Quite a respectable sum, which if expended each year in improvements to the farm and dairy, would double in less time than money at compound interest. That the buyers of our cheese for the foreign markets would refuse to purchase partly skimmed cheese, or that the consumers even would refuse simply because of style or manner of making, is unjust to the parties themselves. It is the quality of goods they want and not the process by which they are produced. And with careful management, with a desire and aim to make the best possible quality of goods, and skimming only so far as to avoid waste of material, we may and can make a cheese that will command the taste and appetite of the consumer, and thereby the attention and purse of the buyer.

Mr. Farrington, of Yates, said that the most preferable cheese in the Scranton market was that of Mr. Blanding, two years ago. Last year New York dealers paid more for it than it would sell for in Scranton, so that it did not appear in the latter market. In my own experience, I found that my skimmed cheese sold in Scranton for more money per pound than unskimmed Oswego county cheese. Our greatest skimming was a pound of butter from 75 pounds of milk. I do not wish to say that that cheese was better than any whole milk cheese, but I do say that it was not inferior. I am satisfied that it would have sold for the highest market price in any market. In fact I sold the same kind of cheese in the New York market for the highest price. The point is simply this: When, with the best skill that can be produced, so much butter runs off into the whey vat, is it not better to save it? The main thing to be encountered is the prejudice of the trade.

Mr. Goodenough, of St. Lawrence—The factories of my county do hardly any skimming. We make for the Boston market principally. Prejudice being so strong against skimming, we dare not do it. I know factories that pledge their patrons even not to touch their milk. Buyers tell us that they do not buy cheese for spring trade in Herkimer county, because they skim so much there, and think it better, in some sections of the country, to skim the cream rather than let it run into the whey vat. We have no surplus of whey butter. We use $9\frac{1}{2}$ pounds of milk to one of cheese. I came here to learn, and was disappointed that teaching in dairy matters should advise skimming. I

think we should lose in the reputation of our cheese what we gain in making butter. It is a retrograde that I fear.

Mr. Farrington—The feed may be different in St. Lawrence county. Butter may not run away so much in that county.

Mr. Ellison, of Herkimer—I think Mr. Blanding has told us the difficulty in this matter; that is, the time when to stop skimming. If any one can fix this point, that is what we want to know.

The chair was appointed as a committee to petition Congress for an appropriation of \$500 to assist in publishing the annual report.

Mr. Hawley, of Onondaga, moved that each speaker be limited to five minutes on his first speech and three on his second. Carried.

Mr. H. Farrington spoke against skimming. He did not see that pecuniary advantage was gained.

Mr. Moon, of Herkimer, offered statistics to show that less money was made by skimming. The quality was also the main issue. If the quality was not injured, all right. It is all nonsense about New York men not knowing the difference between skimmed and unskimmed cheese.

Mr. Burnham, of Chautauqua, gave a few statistics with reference to skimmed cheese. At several factories the October cheese sold in New York for an average price of about 16 cents.

Mr. H. Farrington—What was the size of the cheese?

Mr. Burnham—There were two sizes—one of 20 and one of 9½ pounds. [Loud laughter and applause.]

Mr. Goodenough claimed that with good milk there was no oily substance seen on the vat. We keep our milk at a temperature of about 70° and this holds the cream. In this way we find but little surplus cream in the whey vat.

This subject was discussed in a lively manner by a great many practical cheese-makers, without definite decision.

On motion of Mr. Farrington, Chester Hazen, of the Wisconsin Dairymen's Association, was made vice-president of the association.

Mr. Curtis thought that where the waste came in was by cutting the curd too soon, and stirring too much.

The convention took a recess until 1:30.

AFTERNOON SESSION.

The convention came to order at 2 o'clock, Mr. T. D. Curtis in the chair.

Mr. Harris Lewis, of Herkimer, offered the following resolution:

Resolved, That we would urge upon patrons and cheese-makers the great necessity of avoiding any process of manufacture which shall tend to lower or depreciate the quality and product of American cheese.

In connection with the resolution, Mr. Lewis forcibly and unanswerably presented his reason for offering the same.

Mr. Hawley spoke in favor of the resolution.

The resolution was carried unanimously by a rising vote.

Mr. Boufoy, of Herkimer, moved that the committee for the consideration of the purchase of an experimental state farm be instructed to push that matter as actively as possible. Carried.

Mr. S. A. Farrington, of Yates, read the last paper of the convention. He said:

Mr. President, Ladies and Gentlemen:—I hope no one will think that I shall presume to instruct this intelligent body of cheese-producers and practical manufacturers in making and marketing cheese, as I intend only to refer briefly to some of the more important defects which I conceive to exist in our method of operations, and by “our,” I mean more particularly the southwestern dairying section of this state. It may, however, apply to a greater or less extent to other dairy sections. Almost ever since the organization of the cheese factory system, the chief end sought seems to have been the quickest and largest return, too often, irrespective of quality, especially long keeping of goods produced. At our conventions, in the discussions and addresses of agricultural societies, and in the public prints referring to the dairy interest, our public speakers and writers, as well as scientific and practical men, have been trying to elevate the standard of American dairying, and unquestionably not without great benefit to the dairy interest, as no one doubts that there has been great improvement in this branch of industry.

A good amount of information has been and will continue to be derived from these and similar annual gatherings, and from the speeches and writings of those who are making the dairy a subject of thought and reflection. But great as has been the improvement there is yet room for more. In this, in common with other interests, “the march of progress is onward,” and he who affects to overlook or ignore this fact will soon find himself a long ways behind the age. In the manufacture of cheese, in order that success may be obtained, as a matter of course, the condition of the raw material is of the first and greatest importance. But it would seem, from the condition in which milk often comes to our factories, as seen sometimes when received, but more frequently after the development of a few hours, that too many patrons supposed that by some sort of magic the manufacturers could and must produce a large amount of first-class goods from milk given by cows in an unhealthy condition from high temperature, or from being obliged to subsist upon sour or dry or scant herbage, or from being obliged to drink stagnant or unwholesome water, or from being confined in an impure atmosphere caused from the decomposition of animal or vegetable matter, or from milk being confined in close cans a long time in hot weather without being aerated or cooled, saying nothing about cleanliness in milking, &c. Any of these conditions will produce impure and diseased milk. Intelligent manufacturers need no confirmation of this statement. But to those unfamiliar with the different conditions of milk, it is only necessary to refer them to the very able and instructive addresses before this association, of Prof. Caldwell, three years ago, and L. B. Arnold, Esq., one year ago. I state, without any fear of contradiction, that however much skill may be displayed in the manipulation and care of such milk, a healthy, fine flavored cheese, of long keeping qualities, can never be produced. I wish to refer right here, to a condition that is quite generally expected, and often required of manufacturers, and that is that he shall produce first-class goods, (or become responsible if not), from all the milk he receives. There seems to be a great lack of information upon this

point. Every experienced manufacturer can testify that he has often received milk that appeared to be all right, but after standing a few hours would develop its defects. And, too, that often one or more of his vats would work badly when that (samples taken from the same milk) in his test tubes or tumblers, showed no defects whatever, which by the expert is readily accounted for from the fact that the leaven contained in one or more cans, being mixed and heated in the vat, "leavens the whole lump," while that in the test glasses from not being heated frequently, does not develop its impurities. This then, often being the case, how can or ought the manufacturer to be held responsible for the result in all cases. All that should be required of the manufacturer is, that he be vigilant in receiving milk, and make and take care of his goods in a skillful and workmanlike manner.

While upon this subject and that of flavor I cannot better express my views than in the language of Mr. Willard, in an address before the State Agricultural Society, at Albany, several years since. It is well for me to say that upon the dairy no man's opinion stands higher than that of Mr. W. He says "the great defect in much of our cheese is its flavor. We are too careless in milking and in handling the milk when taints can be absorbed. We put the warm milk in cans, confining it with a close-fitting cover, and haul it a long distance in a blazing sun, to the factory, and it often is in a putrified condition before going to the vats. What wonder, then, that much of our cheese, rich in butter and splendidly manufactured, is out of flavor, and vast sums in consequence are lost. American dairymen have been trying for years to discover wherein this defect of flavor can be remedied. From my observations, both at home and abroad, I am convinced that first principles have been overlooked, that we have been trying to make a finely flavored cheese from imperfect milk, a condition which manufacturers never have and never will be able to accomplish. A reformation must be had in securing clean and perfectly pure milk, together with better curing rooms, and then under our improved system, American cheese will stand where our nice grades already do, as the richest and finest that the world produces." Upon another occasion, referring to the same subject, he says the superintendent or manufacturer should insist that his patrons deliver good milk. We say to manufacturers speak out plainly upon this matter and say that you will not be held responsible for bad cheese when patrons neglect or refuse to do their duty. This is but just to all parties concerned. How often is it the case when the manufacturer requests a patron to be especially particular with his milk, cans, &c., as he is occasionally having a vat that does not work just right, that he is met with the (many times indignant) reply, "Why, my milk must be all right, as we take particular pains with our pails, cans, and in milking, and bring it just as it comes from the cow, and it cannot be possible that there is anything wrong with it?" Without stopping to think, or perhaps caring to know, that there is a chemical change going on in the milk from the time it leaves the udder of the cow, and that change is decomposition, and is very rapid at a high temperature; and that to arrest its progress it is necessary to expose the milk to the atmosphere and liberate these germs of decay. And, too, how often is it the case, when referring to the importance of these considerations, the patron will reply, "Oh, yes, I see the propriety of your suggestions; think there should be more attention paid to the matter, but then I bring my milk as good as my neighbors, and we

get as much for our cheese as neighboring factories, and what will it amount to if I should take more pains? So much as to say, "two (or perhaps a dozen) wrongs will make one right." Without intending to cast any reflections upon the intelligence or integrity of factory patrons, I must say there is by far too little disposition manifested on the part of many to ascertain what is requisite to the production of fine goods. There is too much of an inclination to throw all the responsibility upon the manufacturer, and for a part of this state of things the manufacturer is to blame, and in what way I will show after a little. As I have said before, I think these conventions are productive of a great amount of good, and it is to be regretted that so few of our factory patrons avail themselves of their advantages by attending and taking active part in their proceedings. Patrons too generally allow their interests to be misrepresented. Every factory should send a committee of one or more of its patrons to this convention every year, and have the report put into the hands of every patron, and the cost to be reckoned with their factory expenses. Who doubts for a moment that a great amount of good to the dairy interest would result from such a course? Thus far I have referred more particularly to what I consider to be the duty of patrons, but far be it from me to wish to shield the manufacturer from any responsibility that justly belongs to him, and right here I wish to refer to the demand that many times belongs to both patrons and manufacturers, and that is with regard to factory buildings. More pains should be taken in their location and construction. Every work-room should be so arranged that all whey and slops may be immediately conducted away and not left to saturate the ground underneath, to decompose and give off a very disagreeable and unwholesome odor that is sure to taint the milk and injure the cheese. Whey vats and pig pens should never be tolerated near the factory, for be it remembered that anything that is offensive to the smell, near the factory, will always injure the flavor of the cheese. In fine, every factory should be so arranged and conducted that it may be kept as sweet and pure as the most scrupulously kept kitchen. Curing-rooms should be so constructed that more uniform temperature may be obtained than is possible in our cheap, barn-like factories. However pure may be the milk and skillfully manufactured, if it is cured in a temperature varying from 50° to 90°, the result cannot be fine cheese. And, too, there should be sufficient room to hold the cheese if the weather or market was such as to require it, and not be obliged to force upon a dull market. And now a few words to manufacturers. There is too much of a disposition to keep from patrons the facts in relation to the manner that the cheese works and the condition of their cheese (I mean when it works badly) and hence our reason why patrons are many times so slow to realize that there is anything more required of them than they are already doing. There should be a better understanding between manufacturer and patrons and a more mutual feeling of interest manifested. Farmers clubs should be organized in every town.

Another very reprehensible feature is that of trying to keep the buyer from seeing or trying defective cheese, as every skillful manufacturer can work up almost every curd so that the cheese will look all right on the range or counter. Saying nothing about the wrong of the deception practiced, as a matter of policy it is not the best, as such cheese will be found, sooner or later, to the disadvantage of the factor.

Every defective cheese should be marked, so the seller in the market will readily know it, and not have to injure the sale of a whole shipment, or he himself may be deceived. Manufacturers should be more conversant with the wants of the trade, and not confine themselves too closely to former practices, irrespective of improvements that may be made. I have no sympathy with the practice of sending off curd. With us the opinion quite generally prevails that all cheese made in hot weather will (and must necessarily) get off flavor if kept any length of time. An extensive manufacturer and buyer of Allegany county, said to me the past season, that "there was not a factory in the five south-western counties of this state, the cheese of which would carry its flavor more than 30 or 40 days at the most. Hence it was policy to move cheese just as buyers would take it, and thus save in quality and quantity."

Now I beg leave to dissent entirely from this opinion, as I believe it is from just such pernicious teachings and practices as this that we are obliged, every season, to sacrifice two or more cents per pound on most of our hot weather cheese. I know that some cheese made last June and July, is just as free to-day from any impure flavor as it was when made. And I claim that with June milk, skillful manufacture and proper curing, such may generally be the result. The manufacturer may get a large yield of cheese from a small amount of milk, (a requirement too generally made,) it is generally the practice to leave the curd coarse, and heat, (or scald) quickly, (from 30 to 45 minutes,) thereby retaining a larger amount of water in the curd, and not only this, but there is not time enough given to admit of the chemical change necessary to secure a pure flavored cheese of long keeping quality. When such cheese is sold at from 8 to 15 or 20 days from the hoop, of course more pounds are produced and paid for than can be by any other practice. But usually it is some weeks after the cheese leaves the factory before it reaches the consumer, and there is a large shrinkage, and the dealer or consumer (and perhaps both) have to make an allowance for it, and they do, too.

And not only this, but such cheese is like hot cakes or a harvest apple that must be consumed as soon as made or ripe, else they prematurely decay. Soon ripe, soon rotten, is an old adage. I regard this practice as being too much like trying to produce something from nothing.

An English correspondent of the *Country Gentleman* stated, last summer, that the great trouble with much of the American cheese was that it would not keep long enough to give the age required to suit the taste of the aristocracy and, hence, it is sold to the laboring class, because it can be bought cheap. I am informed that the best English cheese is not put upon the market until it is six months old. I have seen it stated by English farmers that American cheese is good profitable food for pigs at 10 cents per hundred weight.

Now, can we afford to make and send cheese to England and sell it for 10 cents per hundred weight? Of course we cannot yet. It seems we sometimes do. If we are forever to let the 55,000,000 or 60,000,000 pounds of cheese, which we annually send to England, make the price on the whole of our 240,000,000 (which, by-the-by, I do not believe anything in) why not cater to their prejudices and furnish such an article as they want.

The past season is an illustration of the correctness of my position.

The fore part of the season we sold our goods at satisfactory prices, but by July we began to crowd our green cheese upon the market faster than there was a demand for it, and it soon began to accumulate, and dealers and shippers very naturally worked the price down *below* the cost of production, and because it was cheap bought largely until the price reached 12 cents, and stopped. They filled up with our hot weather cheese, which, of course, soon lost flavor and would not sell when put in competition with our later and better cheese; consequently the shippers would not buy until they had unloaded their present supply, and the result has been mostly a dull and unsatisfactory fall trade, while the English have not taken their usual amount of us up to the present time by 4,000,000 pounds, which they will undoubtedly want before spring. But before that time most of our cheese will have gone into the hands of the dealers at low figures and they, and not the producers, will make the profit.

I am confident if we had made our cheese so that it would keep, and kept it until cured, and sent it forward only as fast as there was a demand for it, the business would have been mainly satisfactory to all concerned through the whole season. For there is not an over-production, and I believe never will be of good cheese. Patrons should take more pains in furnishing good feed and pure water, and care of the herds in milking, and care of the milk to deliver a pure article. Manufacturers should take more time and pains in making and taking care of their cheese. Make it so that it will keep and not soon lose flavor. Have curing-rooms large enough to hold it until cured and keep it until there is a demand for it and never crowd upon the market when not wanted. By complying with all of these conditions we may, as a rule, always obtain the cost of production. There is no good reason why we should, every season, sell a large amount of our cheese for less than the cost of production. That cheese can be made and kept during and through the hot weather, it is only necessary to refer to the fact that much if not most of the cheese in Canada is kept until fall, and English shippers say their cheese retains its flavor much better than ours. Said a manufacturer to me last summer: "I believe your positions are all sound, but suppose that you and I try to carry them out in practice, what will they amount to? other factories will make and sell just as they now do, while we hold ours, and perhaps get no more than they do." I replied, that may be the case for the present, but we shall have the consciousness of trying to do right (and it always pays to do right.) But if your factory furnishes a fine quality of goods, that will keep without deterioration, it will be known and sought after, and the influence will be good, for if the dairy public can be convinced that it will pay, the thing will be accomplished. And we shall raise the standard of our goods at home and abroad and secure a fair and satisfactory remuneration to all concerned.

The committee on examing dairy machines and inventions then gave their report.

Your Committee on Farming Tools and Dairy Utensils beg to report that we consider the principle of airing and cooling milk, and that as soon as possible after being drawn from the cow, of the first importance to dairymen. The implement presented to us by A. P. Bussey, of Westernville, is a machine which is not expensive, and seems to combine the principle of airing and cooling the milk, and is easily cleansed.

The ingenious machine presented by Messrs. Schermerhorn & Perry, of Newport, for introducing pure air into milk, we deem worthy of further experiments by dairymen.

The gang-press presented by Milton B. Frazer, of Rome, the committee consider to be labor-saving, and to press very uniformly, and to be a source of economy in regard to room.

The Jewett Patent Milk Pan the committee desire to recommend for the reason that it is so constructed as to constantly change the water passing under the pans. The committee suggest that an improvement might be made by having a water channel also on the sides and ends of the pans.

Bingham & Ashfield's (of Syracuse) Patent Strainer is an ingenious contrivance for cleansing and rinsing the strainer.

Dr. Louis S. Robbins' plan or patent invention for manufacturing butter by a new process, and purifying rancid butter, as more fully explained in his circular, the committee deem worthy of a thorough trial by dairymen, and if found as stated will be of great value to butter manufacturers and the public.

The Eureka Feed Box and Manger is a cheap and convenient method of combining a feed box and manger.

The New York Hay Tedder, presented by Stewart Perry, of Newport, we think combines advantages over any hay tedder now in use, with which we are acquainted.

The Ditching Machine of O. & O. S. Foster, of Durhamville, presents an ingenious method of removing the earth for laying tile drains. Its merits can only be tested by practical use.

The committee are surprised at the few dairy utensils presented, and they consider that some cheap method of stirring milk in the can during the night, where the milk is kept at home over night, would be desirable.

L. L. WIGHT,
R. B. LAMONT,
S. T. MILLER.

Report accepted.

THE BLANCHARD PRIZE.

A jar of butter was presented for inspection by Mr. Ellison, of Herkimer. It was examined by numerous members and experts, and was commended by all as a splendid article.

As it was the only sample present it was not entered for competition, and the prize so liberally offered by the Messrs. Blanchard was not taken.

The question drawer was now emptied of its contents. The first question picked was—

“Will ice in milk tend to make floating curds?”

Mr. Bonfoy thought it would not.

Mr. Arnold said that his experience taught him that it would. If you reduce milk to a low temperature suddenly it will cause it to retain the gases that cause animal odor, and odors of that kind produce floating curds as soon as the milk is again warm. In another statement Mr. Arnold said that tainted milk would keep sweet longer than milk not tainted.

Mr. Moon suggested tin cans for cooling. He knew that would remedy the difficulty.

“How shall we improve permanent pastures? and what are the best grasses for pastures?” came up next.

In regard to the first question, Mr. Arnold recommended top-dressing and plaster. In regard to the second, he said the long-leaved grasses, those which have an abundance of leaves and small stems—June grass, for instance, and those which resemble it. He considered June grass, known also as Kentucky blue grass, as the best of all for butter, cheese and beef; not that it produces the largest quantity, but the best quality, both of milk and of meat. Timothy, so much in use, he did not think so good as the varieties with branching head, like red top and orchard grass. The clovers, so much in use in grain-raising districts, were not recommended where best quality of dairy products were desired. They will produce more per acre, but the quality is not so good as from the grasses proper. For quality they stand in the following order: white clover, alsike, small red, large red.

Mr. Lewis—I think a mixture of grasses indigenous to the soil make the best pasture. More feed will be produced where a variety of grasses grow, than can be from a single variety, and stock will eat more and be healthier when feeding upon a variety than upon one kind. A variety of food is as important for our animals as for ourselves. A pasture should contain grasses that will mature at different seasons, some early and some late. For early and frequent cropping, rye grass may be introduced, and orchard grass is also excellent. Varieties that will stand frost and drouth should always enter into the list, as cold winters and dry summers must be provided for in this country. I prefer grass to clover, if fine quality is desired. I do not think as favorably of white clover as many dairymen do. It may be better than some of the larger varieties, but is not equal to grass. Grass is the best food for dairy cows, and the reputation of American cheese is based on grass.

These remarks brought Mr. Farrington, of Canada, to his feet, as an advocate of white clover as one of the best elements in the pasture of a cheese dairy. His views were seconded by several other experienced dairymen, and a lively discussion followed in regard to this plant in which the *pros* and *cons* were pretty evenly balanced.

Next came up “Ought not the State Legislature to pass an act requiring farmers to cut all the weeds growing upon their farms before they go to seed?”

To this it was replied, if the seeds were of such a nature as to spread upon neighboring farms such an act would be appropriate.

As the hour for adjourning was at hand, it was suggested that the reading of the remaining questions be omitted, and that the Secretary append brief answers to them in the report. It was accordingly omitted.

Mr. Schermerhorn, of Oneida, presented the following recipe to cure milk fever in cows: One tablespoonful of copperas; one-half do of nitre in severe cases. Give one dose in the morning and one at night; another dose next morning, and, twelve hours after the last dose, three quarts of red loam.

The convention then adjourned *sine die*.

The questions remaining unanswered are here appended, with their answers:

If the first milk drawn from the cow is unhealthy and unfit for food (although strictly necessary to promote digestion), is it not good proof that the calf should live long enough to have the milk become

good in order that the rennet shall become fit for use in the manufacture of cheese?

And may it not be that the using of the rennet taken from very young calves is a fruitful source of poisoned cheese?

These ideas were suggested by the remark of Mr. Curtis that the appearance of the poisoned cheese and the new milk are so similar under the microscope.

A. A. GOODENOUGH,

St. Lawrence Co., N. Y.

Answers: Query 1st.—The calf ought to live till the milk is good in every instance, and sometimes longer. The use of rennet from calves killed before, tends to make the cheese soft, strong and porous.

Query 2d.—It is barely possible; but the poison cheese which I have seen does not resemble cheese made from such rennet.

How many good rennets should be used in making 1,000 pounds of cheese?

Answer.—It generally takes three of such as are put up by butchers. Two first-class dairy rennets are often sufficient. One will occasionally do it. In one instance I brought 1,125 pounds of uncured cheese with a single rennet.

Is there any use to which *sour* butter-milk can be put better than feeding to calves or hogs?

Answer.—Not that I know of.

Will cheese absorb taints after it is pressed and oiled?

Answer.—It will; and very readily.

What size of cheese is most sought after in the market at the present time?

Answer.—For shipping, those weighing from 50 to 65 pounds, with height equal to two-thirds the diameter. For home consumption, smaller are preferred.

Suppose a farm capable of producing \$2,000 a year, by a proper application of labor, produces but \$1,000, what effect has this difference on the financial prosperity of the country?

Is it a conflict between capital and labor?

Answers: To Query 1st.—Disastrous, is the most appropriate term I can think of.

To Query 2d.—Not necessarily.

What is the best method of treating floating curds?

Answer.—Let them lay in warm whey till the acid is distinctly developed. Cool and air thoroughly, and salt well. It is a good plan to let floating curds lay in the sink over night, when it can be done. If the tendency to such curds is known beforehand, set the milk warmer than usual, and use less rennet. Work at higher temperature and acid will be developed easier, and the result be better.

What is the best method of seeding pastures and meadows, and at what season?

Answer.—If after grain, seed when the grain is sown, whether spring or fall. If seeding without grain, very early in spring, or after the drowth of summer, about August. Clover always in the spring.

COMMUNICATIONS.

DAIRYING IN THE NORTHWEST.

MADISON, Wis., January 11th, 1873.

GARDNER B. WEEKS, *Secretary, etc.* :

Dear Sir :—The main dairy regions of the northwest at present lie in the northern and eastern portions of Illinois and in the eastern half of Wisconsin. Increasing attention is yearly being given to this interest in these sections and also in Iowa and Minnesota. It is impossible to give an accurate estimate of the number of factories and private dairies in the region named. Butter factories or creameries as yet are exceptions; the milk condensing establishment at Elgin, Ill., is yet without western competition. Almost invariably dairymen here devote themselves either to cheese production in factories or at home, to butter making, at home, or to supplying cities or towns with milk.

The northwest has some disadvantages and some advantages in relation to dairying. The winters are cold, the summers are hot and usually dry; running water is not the rule on the farms; the best grasses have not been generally introduced; northwestern dairy products rest under a reputation of not being equal to those of New York or the western reserve.

On the other hand, the climate is admirable for vigorous health of both men and cows, if properly cared for; good water can very generally be obtained at moderate depths, windmills furnishing a constant supply; the soil is fertile and cheap, and readily produces great crops of summer and winter forage other than grasses; and the "tame" grasses and the clovers thrive well when properly introduced; the quality and reputation of northwestern dairy products are steadily improving, the best now ranking well in any market, and last but not least, there is an immense territory, the dairy supplies for which can most readily, naturally and cheaply be supplied from this region. The difference in the average price of land and cows, gives a great advantage to the western dairyman.

The year 1872 was a prosperous one for the cheese manufacturers of the northwest; less so to the butter makers. More than usual drought

lessened the yield of milk, but prices have been satisfactory generally for cheese, and fair returns have been received by the dairy farmers. Ordinary butter has sold at low prices throughout the season. The drought and low prices affected grain farmers even more than the dairymen, and as a consequence new cheese factories will be built in many places, and those now in operation will, probably, have an increased number of cows for 1873.

A difficulty which has a serious effect in reducing profits in many cases, is the building of factories in fields already occupied, or where the milk of only a small number of cows can be secured. I know of but one factory in the northwest having 1,000 cows, and from reports before me, 300 would probably be above the average. This evil will be gradually remedied.

During 1872, for the first time in the northwest, the plan of holding regular market days for the sale of butter and cheese was tried. Weekly or fortnightly meetings were held at Elgin, Ill., and Watertown and Kenosha, Wis. Favorable reports are given by those in charge at each point, and the plan will be followed in future. Hitherto very much the larger part of the cheese made in the northwest has been sold through commission merchants in Chicago. Last year quite a number of car-loads of cheese were shipped to New York from Wisconsin with satisfactory results, and one considerable shipment was made to Liverpool, the net returns being larger than the home market would have given at same date. St. Louis is each year taking larger quantities of our cheese, and large shipments were made, in 1872, to California. It is hoped that, in future, increased efforts will be given to developing the market of the west and northwest.

The fact that much of the best cheese made in the northwest is sold as New York factory, and that very often, only the poorer qualities are sold as western, and also that inferior New York cheese is sold under the name of western, naturally causes some dissatisfaction not entirely removed by assurances that their names only indicate grades or quality, and have no reference to place of manufacture. Without going into the question of the responsibility for this state of the market, it is undoubtedly true that it has worked and continues to work much injustice to the reputation of western dairy products, a poor reputation deservedly having been attached to them formerly, which the present common custom continues.

We have gratifying assurances from competent parties in both New York and Boston of the increasing good quality of our dairy products, and of a consequent increased good reputation.

There is an abundance of room for the dairymen of the east and the northwest. Their products will mingle in the same markets to some extent, but in the main will naturally and most profitably go in different directions. With the advantages in experience, in volume of business, and in name resting with you of the American Dairymen's Association, we of the Northwestern Dairymen's Association send you friendly greetings, claiming to belong to you as also Americans, and engaged in a common cause, and as a younger sister, are vain enough to look forward to the time when in the quantity and the excellence of dairy products, the great northwest shall fully equal the great east.

We will be glad to welcome a large delegation at our seventh annual

meeting at Whitewater, Wis., January 21, 23, or at the meeting of the Wisconsin State Association, at Watertown, February 11, 12.

G. E. MORROW,

Secretary Northwestern Dairymen's Association, Madison, Wis.

PIERREPONT, MARCH 4th, 1873.

L. B. ARNOLD, Esq.:

Dear Sir:—In keeping with my promise when at Utica, I will now attempt to give you our method of making cheese.

We take in our milk evening and morning of each day in the usual manner. That taken in the evening is cooled by dipping and floating ice in a tin tub holding about four pails full, until cooled down to 70°. We have running water passing through the water vat all night in hot weather. In cool weather we shut it off, designing in either case to cool down to 65°; when this temperature is reached we prefer the milk should stand still, believing that agitation tends to separate the butter from casein, and thereby causing waste. Where the milk remains quiet through the night at the temperature above indicated, the cream in the morning will be limpid and very light, but should not be stirred until the morning milk arrives in sufficient quantity to enable the maid to skim at the same time that the new milk is running into the vat, when the cream should be removed with the dipper and passed through the strainer with the new milk with the temperature of the vat at 70°, with the heat turned on to secure this point if necessary, gradually raising the heat to 82°. At this point if due care has been taken and the vat sufficiently stirred to secure an even temperature, there will be no more appearance of cream than on new milk, nor will it separate any more readily. We now add the rennet in sufficient quantity to have it give evidence of coagulation in about twenty minutes, we agitate the mass occasionally to as near this point as in our judgment is safe, believing it unwise to continue after coagulation has commenced, as it tends to produce a soft curd. A slight agitation of the surface with the dipper may be continued some minutes to keep the cream incorporated with the milk until the action of the rennet is sufficient to retain it. This is an important point in avoiding waste. When the curd is sufficiently firm to cut, which is usually in about 50 or 60 minutes, we use our horizontal knife, first cutting it away, then the perpendicular knife cutting into cubes, then let it stand 8 or 10 minutes when the maid with careful hands turns up the curd, and the knife in a careful and skillful hand commences its work, *and here is a point where there is much danger of waste; never cut fast enough, or stir hard enough, to whiten the whey.* A small amount of heat may be turned on after the second time of cutting around. Let it take at least 15 minutes to cut a vat sufficiently fine, and about two hours, more or less, as the milk works fast or slow, to raise the heat to 98°. The heat is then turned off and the curd allowed to rest, turning it up once in half or three-fourths of an hour, until the acid is sufficiently developed, when we draw off the whey with a syphon, let the cold water under the vat, cooling below 90°, when we dip the curd into the sink, cool and salt, using 2½ lbs. F. F. salt, fall and spring, in hot weather use 2¾ lbs. to one thousand

lbs. of milk and put to press. If the above rules are strictly followed, and no instrument of torture put into the curd while cooking, to bruise or mar it, there will be no danger of chunking in the vat or in the sink. The curd should never be broken—always cut, then it will not weld together or waste its richness, neither will there be any more complaint that the cream cannot be worked back. I have thus minutely touched upon those points which I deem important to save waste in the manufacture of cheese. Yours truly, A. A. GOODENOUGH.

[From the Country Gentleman.]

AUGUST CHEESE OF 1872.

An unusual state of things exist in the cheese market at this time, and has obtained for several weeks, which is worthy the thoughtful attention of all interested in the manufacture, sale and consumption of cheese. About as soon as the cheese made during the month of August began to reach the market, dealers and shippers found its flavor much impaired. As time went on the trouble increased, until matters arrived at such a pass that dealers in New York city declined to buy August cheese, except at a much reduced price. So decided, indeed, are they, that with their own hands they will turn the cheeses out of the boxes, and if "August" is stencilled or written on the side, the cheeses are condemned. This state of things continues, and is likely to prevail until the August cheese is gradually worked off.

Such being the fact, it were well to inquire into the cause of the trouble. Without pretending to go into the matter elaborately, I desire to call attention to one fact which should not be overlooked. The weather during the greater part of August was very warm; the air very oppressive, lifeless, muggy. As a consequence, the cows were affected by the heat, and their milk was feverish, tainted, unwholesome. Especially would this be the case in localities where the pastures are low and wet, and the water which the cows were obliged to drink, stagnant and slimy.

Had this milk been thoroughly stirred, cooled, and aired, before being made into cheese, the result would have been a much finer product, and much more money would have been realized from its sale. Dairymen are slow to learn the necessity of cooling and airing their milk before it goes to the factory, or before it is made into cheese at home (and the appliances for doing this are many, simple and not expensive,) and never before has this necessity been made so apparent as during the present autumn. Shippers and dealers having taken the stand they have in relation to the August cheese, it comes home to the dairyman as a matter of profit and loss, and the pocket being touched, it is the most convincing argument that can be brought to bear upon them; and yet, as a purchaser of cheese, I find it difficult to convince the dairymen of the truth in this matter, or of the cause and remedy for the trouble which exists. With the August, September and October cheese on the tables at the factories, it is hard to make the salesman believe the first named—being the oldest and best cured—is not worth as much or more money than the others.

In buying, it is rarely necessary to taste of the cheese, but in examining about 400 August and September cheeses at a factory in Cayuga county, about ten days since, I tasted of some six or eight different ones of the August make, as a matter of curiosity, and by way of verifying the opinion I had formed of them. In taste they were all sharp, biting, acrid, and though a bit only about as large as a bean was taken of each, yet the result was a dizziness which lasted for hours, and a derangement of the stomach which was noticeable for thirty-six hours, thus convincing me that they were of a mildly poisonous nature. On relating this circumstance to an Oswego county cheese-maker, he confirmed my opinion by stating that he had been similarly affected from the same cause. Doubtless these same cheese, when cut and exposed to the air, would lose this deleterious property, in a great measure, but in its best estate such cheese is neither desirable nor wholesome. It should be stated, in this connection, that the weather during the latter part of August was cooler and more favorable, and as a consequence, the cheese made then is generally mild, rich and pure in flavor, equal to the September cheese, which in my judgment is ordinarily the best made in the entire season.

In the case of many factories, the September and October cheese is being sold, and the August cheese retained, in hopes, probably, that "something will turn up." This appears to me an unwise course.

GARDNER B. WEEKS.

SYRACUSE, N. Y., Nov. 7, 1872.

[From the Utica Herald,]

LOWVILLE, Lewis Co., N. Y., March 14, 1873.

In our attempt to get returns from the cheese factories of our county, we issued some fifty circulars and received replies from twenty. Of these twenty factories, ten took the cream from the night's milk, some for a part and some for their entire season, and manufactured it into butter. The remaining ten factories made only cheese.

The twenty factories report 7,480 cows, 18,056,281 lbs. milk, 1,827,773 lbs. cheese, 18,370 lbs. butter; the cheese bringing \$224,383.89; the butter \$3,941.03; average \$30.52 per cow; using 9.878 lbs. milk for one lb. cured cheese, and 9.78 lbs. milk for each lb. of product: each lb. of milk averaged \$0.01264; each pound of cheese \$6.1227. The ten factories that made only cheese report 3,602 cows, 9,409,792 lbs. milk, 956,740 lbs. cheese, and cash \$118,327.77. Average per cow, \$32.85; milk per lb. cured cheese, 9.835; each lb. of milk averaged \$0.01257; each pound of cheese \$0.1237.

The ten factories making butter report 3,878 cows, 8,646,489 lbs. milk, 871,033 lbs. cheese, 17,158 lbs. butter, \$106,056.12 for cheese, \$3,718.20 for butter. Average per cow, \$28.31; milk per lb. cured cheese, 9.926; milk per lb. of product, 9.734; each lb. of milk averaged \$0.01269; each pound of cheese \$0.1217.

The exact average value of a lb. of butter cannot be determined, as one man reporting 1,107 lbs. butter sent the aggregate amount for both butter and cheese; it would not vary much from twenty-three cents.

The milk, where the skimming process was employed, brought 95-100 of one per cent. more than the milk where only cheese was manufactured, and the whole milk cheese brought \$1.61 per cwt. more than the partially skimmed cheese.

From the above exhibit you see but little difference of profit in the different systems; but as all these amounts are gross amounts, and as the cost of manufacturing butter is greater in proportion to its value than cheese, the gain of 95-100 of one per cent. in the gross would not be maintained in the net value.

The average per cow is small. Our cheese making season seldom exceeds six months. Some factories stopped unusually early by reason of drouth and grasshoppers.

If any facts herein are of sufficient interest for publication they are at your service.

Truly yours,

C. L. SHELDON.

FACTORY REPORTS FOR 1873.

NEW YORK.

TOMPKINS COUNTY.

McLean Factory, McLean.—Commenced making cheese April 15, and closed Nov. 23. Whole amount of milk brought to the factory, 2,566,344 lbs.; whole amount of cured cheese made, 271,466 lbs.; amount of milk required to make a pound of cured cheese, 9.453; number of cheese made, 4,964; average weight, 54.685-1,000 lbs.; whole number of sales made during the season, 16; amount of cheese sold for shipment, 263,720 lbs.; amount sold for home consumption, 7,746 lbs.; whole amount of money received for cheese, \$36,646.91; average price per lb., 13½ cents; made 2,320 lbs. of whey butter which is not included in the above amount; paid John M. Schermerhorn, maker, \$4,207.72, which includes boxes, bandages, salt, annatto, rennets and fuel, weighing, making, branding and loading cheese in wagon; amount paid for use of factory, \$1,085.86.—A. B. LAMONT, Salesman.

MADISON COUNTY.

Excelsior Factory, Brookfield.—Pounds of milk received, 1,266,347; lbs. of cured cheese made, 129,330; lbs. of milk for one lb. of cheese, 9.79; amount of net receipts, \$14,107.10; dividends to patrons on each 100 pounds of milk, \$1.114.—F. BLANDING, Manufacturer and Secretary. WILLIAM STANBRO, Treasurer.

Quaker Basin Factory, De Ruyter.—Total amount of milk for season, 1,177,681 lbs.; total amount of cheese made, 121,567 lbs.; number of sales made, 11; average price per lb., 12¾ cents; gross receipts, \$25,268.12; total expenses, \$1,994.50; net proceeds to patrons, \$13-

273.62; net price of milk per lb., 1.012; average number of pounds of milk per lb. of cheese, 9.68; average number of cows, 340. From April 25 to Nov. 8.—J. BUCKINGHAM & SON, Manufacturers.

Payne's Factory and Creamery.—During the past season had 185 cows; number lbs. milk, 666,500; number lbs. skim cheese, 39,390; number lbs. butter, 21,000; we used the deep coolers, set 18 inches deep, in good spring water; pool is 12 by 22 feet, divided in two parts; milk was kept 12 to 24 hours, then skimmed and made into cheese; cream was kept until sour, then churned; paid for milk, \$1.08 per cwt., and took all risks, maker having an interest in the business; paid for milk in following manner: April milk, 1st day of June, May milk, 1st of July, and so on.—THOMAS STRADLING, Manager of Creamery.

ST. LAWRENCE COUNTY.

South Canton Factory, South Canton.—Time of making season 7 months, number of cows, 900; number of pounds of milk, 2,117,956; number of lbs. cured of cheese, 219,092; total of cash receipts, \$28,942.84; average price per hundred, \$13.21; average pounds of milk to one of cured cheese, 9.66.—W. SPALDING, Manufacturer.

Pierrepont Factory.—Number of cows, 400; time of making, six months; number of lbs. milk used, 971,065; number of lbs. cured cheese, 133,528; average number of lbs. milk used for one of cured cheese, 9.37; average price per hundred for season, \$13.43; cash receipts for season, \$13,903.84.—A. A. GOODENOUGH, Proprietor. F. A. MORRISON, Manufacturer.

West Canton Factory.—Number of cows, 600; number of lbs. milk used, 1,317,745; number of lbs. cured cheese, 136,552; average price per hundred, \$12.89; number of lbs. milk to one lb. cured cheese, 9.64.—J. B. MEAD, Proprietor and Manufacturer.

Hildreth's Factory, Canton.—Number of cows, 300; number of lbs. milk used, 768,934; number of lbs. cured cheese, 79,716; number of lbs. milk to one lb. cured cheese, 9.64; average price per hundred, \$12.—H. D. HILDRETH, Proprietor.

The number of factories now in successful operation in St. Lawrence county is 22. The foregoing are among those handed in at the annual meeting of the St. Lawrence County Dairymen's Association, which convened at Canton, Jan. 4th, 1873.

Respectfully yours,

A. A. GOODENOUGH,
Pres. St. Law. Co. Dairymen's Ass'n.

ERIE COUNTY.

Union Collins Factory, Boston.—Estimated number of cows, 1,200; amount of milk received, 3,545,645 lbs.; total lbs. cured cheese, 355,009; ratio of lbs. milk to one lb. cheese, 9.98; number of sales, 24; average price per hundred lbs., 13.25.—L. L. HORTON.

CORTLAND COUNTY.

Tuttle's Factory, Freetown.—Factory opened May 5th, and closed November 9. Whole number of cows, 364, though a number of dairies were brought in only three or four months of the hottest weather. If they had been kept in through the season, our figures would have been much larger. Total number lbs. milk, 1,092,927; total number lbs. cheese, 110,847; number lbs. milk to one pound cheese, 9.85; gross receipts, \$13,563.20; gross expenses, \$1,751.37; expenses per cwt. \$1.58 average price per lb. received, 12.23 cents; net. \$11,811.83.

SULLIVAN COUNTY.

Bethel Factory.—Factory opened March 10, and closed Dec. 21, 1872. total amount milk received on hay, 176,393 lbs.; total amount of hay cheese made, 14,947 lbs.; average number lbs. milk for one lb. cheese, 11.80; total amount milk on grass, 1,346,065 lbs.; total amount cheese from grass, 139,458 lbs.; average number lbs. milk to one lb. cheese, 9.64; cash received by patrons, \$17,857.06; total number lbs. milk delivered, 1,522,458; total number lbs. cheese made, 154,405; number of cheese made, 2,557; average weight, 60.38 lbs.; average price after paying all expenses, \$11.56 net. per 100 lbs. of cheese.—L. G. YOUNG.

ALLEGANY COUNTY.

New Hudson Factory.—There was manufactured at this factory during the year 1872, 2,800 boxes of cheese, averaging about 62 lbs., from 1,618,720 lbs. of milk, averaging about 9½ lbs. milk for one lb. cheese, amounting to 173,546 lbs. of cheese, which was sold at from 10 to 13½ cents, averaging a trifle over 12 cents per lb. for the lot, and amounting to \$20,914.24.—W. M. SIMPSON, JR.

ONEIDA COUNTY.

Weeks' Factory, Verona.—Season began April 1, closed November 9. Whole number of cows, 950; average number, perhaps, 875; lbs. milk received, 3,171,594, which made, of cured cheese, 320,905 lbs.; lbs. of milk required for one lb. cured cheese, 9.88; average price per lb. for cheese, 13.198; net to patrons per 100 lbs. milk, \$1.16¼ cent.—G. MERRY.

Ward's Factory, Holland Patent.—Had the milk from 400 cows, which sent to the factory 1,405,758 lbs. milk, which made 142,948 lbs. cheese, taking 9.83 lbs. milk for one lb. cured cheese, which net the patrons 1.12 for each lb. milk; the factory opened April 17, and closed November 11; making an average of nearly \$39 per cow; I have a farm of 150 acres, 50 of which is woodland; took the milk of 21 cows to the factory the past season, which amounted to 89,489 lbs., netting \$48.14 per cow, besides making before and after the factory season 400 lbs. cheese and 350 lbs. butter, which, if sold at the going prices, would have brought \$146, and makes the net of \$55.09 per cow, with but very little grain and no sowed corn. The most of my grain feeding is boiled oats, and only two or three weeks in spring.—N. WARD.

Delta Factory, Delta.—Amount of milk received, 2,972,005 lbs.; amount of cured cheese sold, 296,571 lbs.; cash receipts for cheese sold, \$39,177.68; number of cows, 900; cheese sold at prices ranging from \$14.75 to \$10.37½ per 100 lbs.; average, \$13.21; paid Mr. Squires for making, \$1 per 100; other expenses, 52⅔ cents per 100; factory opened April 2, closed November 16.—GEORGE T. DENISON, Salesman and Treasurer.

Whitesboro Factory.—Commenced March 23, closed November 10. Number of cows, 900; lbs. milk received, 3,183,953; lbs. cured cheese made, 313,832; lbs. milk to one lb. cured cheese, 10.14 nearly; average receipts, 12.99-100 cents per lb.; expenses of making and furnishing, 1.82-100 cents per lb.; net per lb. distributed to patrons, 11.17-100 cents; net value of one lb. milk, .011009 cent.—L. L. WIGHT.

WYOMING COUNTY.

Empire Factory, East Pike—Received the milk on an average throughout the season of about 250 cows, viz: 756,087 lbs. milk, and of which was made and sold at eleven different sales, 75,690 lbs. cured cheese, at an average price of 11¼ cts. per pound. Paid R. McCubbing \$1.75 per cwt. for making, who succeeded in giving general satisfaction to the patrons, and made the cheese in the cheddar system.—R. J. HORNING, Salesman; B. McCUBBING, Assistant.

HERKIMER COUNTY.

L. F. Central Factory—Factory opened March 28th, closed December 13th; Greatest No. of cows, 405; whole No. lbs. milk, 1,767,064; whole No. lbs. cheese, 171,418; number of cheese, 2,861; No. lbs. milk to lb. cheese, 1.3; No. sales cheese, 25; amount cash sales, \$22,383.28; cost of manufacturing, \$2,814.28; cost per 100 for manufacturing, \$1.659; apportioned to patrons, \$19,539.55; average price

per lb. cheese, .1305; average weight of each cheese, 60 lbs.; average price per lb. milk, .0126; average price per lb. milk, after deducting cost of manufacturing, .011; amount milk delivered per cow, 4,365; amount cheese per cow, 423; amount cash received per cow, \$55.26; net amount to patrons, \$48.24.—JAS. H. UHLE, Clerk.

Newville Factory—No. patrons, 34; No. cows, 876; lbs. milk, 3,279,733; lbs. cheese, 322,821; amount received, \$42,234.32; average price per cwt., \$13.08; average price milk per cwt., \$1.11; lbs. milk to 1 lb. cheese, 10.16; total number cheese, 5,608; average weight cheese, 57.56; number days run, 270; price per cwt. for making, \$1.75; number sales, 28. Directors for 1873, Robert G. Bellinger, Edward Simms, Stephen G. Spoor. Manufacturer for 1873, Andrew G. Weatherwax.

Manheim Center Factory—No. cows, 860; lbs. of milk received, 3,414,207; lbs. of cheese made, 333,475; average lbs. cheese to each cow, 388; price received for sales at 13½ per lb., \$43,391.15; gross income per cow, \$51; deducting cost of manufacture, the net income is per cow, \$44.40.

Manheim Turnpike Factory—Opened March 11th, closed Dec. 13th. No. of patrons, 11; No. cows, 351; No. lbs. milk, 1,502,025, No. lbs. cheese, 147,130; amount of money received, \$19,389.94; average price cheese per cwt., \$13.17; average price milk per cwt., \$1.29; lbs. milk to one of cheese, 10.20; No. of cheese made, 2,514; gross income per cow, \$55.24; net income per cow, 48.11; average lbs. cheese per cow, 419. From one dairy of 34 cows we have received this season 190,441 lbs. of milk, making 549 lbs. of cheese per cow.—A. VAN VALKENBURGH, Secretary.

Dated January 31, 1873.

Norway Association.—Commenced making March 11th, closed Dec. 10th. Whole No. lbs. milk, 1,781,621; whole amount of cheese, 184,000 lbs.; whole No. cheese made, 3,250; average price per 100 lbs., \$13.22; whole amount of money, \$24,317.20; cost for making and furnishing, \$3,220; average price lb. milk, 91.367; No. rennets, 737; No. lbs. cheese per rennet, 250; average weight per cheese, 56 2-5; net amount to patrons \$21,097.27; average No. of cows, 450; No. lbs. of cheese per cow, 408; average income per cow, \$54.03; average amount of milk per cow, 3,959; net value per lb. milk, 01.184; No. of sales, 24; price per 100 for making and furnishing, \$1.75; net income per cow, \$46.88.—J. E. LAMPHERE, Maker. A. P. ROOT, Treasurer.

C. W. & J. Smith's Factory, Frankfort—No. of cows, 500; commenced March 18, closed Dec. 8. No. of boxes, 5,800; whole No. lbs.

of milk, 5,459,999; price per lb. of milk, 1.2776; No. lbs. milk for lb. cheese, 10.11; whole No. lbs. cheese sold, 342,018; sold at average price, \$12,924; amount less making average price, 11,246; paid patrons, 38,463.38. Received for making and furnishing, selling and making out sales, \$1.65 per 100, and one rennet per cow. The patrons paying insurance on cheese and my expenses to attend Board of Trade on market days.—C. W. SMITH, Treas.

J. D. Ives' Factory, Norway—Commenced March 18, closed Dec. 14. No. cheese, 4,850; No. lbs. milk, 2,537,227; No. lbs. cured cheese 267,929; No. lbs. milk to a pound of cured cheese, 9.46; amount of cash sales, \$35,442.64; cost of making, furnishing and selling, \$4,694.29; net balance to patrons, \$30,748.35; net value of 100 lbs. of milk, \$1.2119; amount of milk received, cheese made, and quantity of milk used for a pound of cheese in each month, as follows:

	Pounds of Milk.	Pounds of Cheese.	Lbs. Milk to 1lb. Cheese.	
March.....	32,479	2,668	11.73	Skim milk.
April.....	123,611	11,288	10.95	One mess skimmed.
May.....	306,737	31,493	9.42	Whole milk.
June.....	502,910	52,256	9.63	do
July.....	477,246	48,126	9.91	do
August.....	396,862	41,620	9.53	do
September.....	340,339	37,890	8.98	do
October to November 9....	305,026	36,184	8.52	One mess skimmed.
November 10 to Dec. 14....	52,017	6,404	8.12	do do

B. B. MOON, Maker.

Norway, Feb. 1, 1873.

OTSEGO COUNTY.

Eagle Creamery, West Edmeston—This creamery was designed for the manufacturing of butter and cheese, June 1, 1872. From that time to Dec. 1, we received 2,392,589 lbs. of milk, from which was manufactured 55,334 lbs. butter and 181,528 lbs. cheese, making a total product of 236,862 lbs. butter and cheese taking 10.10 of milk for one pound of product. The amount received for butter was \$17,172.55; the amount received for cheese was 17,916.59; gross amount received, \$35,089.14. After deducting all expenses for making, furnishing, freight, &c., this leaves a net money dividend \$28,690.26. Return to patrons, \$1.199 for every 100 pounds of milk.—HIRAM BROWN, Manufacturer and Salesman.

STATISTICS OF LEWIS COUNTY—COLLECTED BY C. L. SHELDON.

NAME OF FACTORY.	LOCATION.	Number of cows.	Lbs. milk received.	Lbs. cheese made.	Am't received for Cheese.	Pounds of Butter.	Amount received for Butter.	Aggregate.	Average weight of Cheese.	Average yield per cow.	ADDRESS.
Leyden Cheese Association...	Leyden Hill.....	520	1,665,240	166,145	\$20,926 33				68 9-10		L. S. Loomis, sales'n.
Sugar River Cheese Factory...	Houseville.....	500	1,565,816	155,404	18,824 07				60		Chas. C. Howe,
Houseville	Houseville.....	650	1,865,222	194,271	24,308 87				59		James Roberts.
Welsh Hill	Welsh Hill, Turin.....	330	654,378	68,616	8,558 84				55		D. D. Carpenter,
D. D. Carpenter's	Pinckney.....	100	144,655	14,265	3,936 87				56		Geo. C. Young,
G. C. Young's	Denmark.....	140	336,872	32,685	8,653 62				60		W. W. & A. D. Vorce,
W. W. & A. D. Vorce's	Denmark.....	270	705,705	69,583	8,653 62		1,954	\$437 96	57		Wm. A. Lasher.
Lampher	Harrisburgh.....	200	407,363	41,326	5,109 43				70		S. Windecker, S'n.
South Harrisburgh	Harrisburgh.....	370	582,163	60,621	7,704 66				63		F. M. Whitney.
Copenhagen	Denmark.....	280	623,786	59,900	10,717 50			\$7,538 87	60		J. M. Wallace.
J. M. Wallace	Denmark.....	425	876,873	88,045	14,959 83		1,121	35 20	65		F. C. Gowdy.
West Martinsburgh	West Martinsburgh.....	500	1,273,815	125,034	14,959 83				65½		E. G. Dodge.
E. G. Dodge's	Martinsburgh.....	250	732,602	75,158	9,335 80				39.64		Rees & Denice.
Lowville	Lowville.....	850	1,881,373	195,738	23,620 53						
						Whey Butter.					
Sulphur Spring	".....	590	1,385,652	144,431	18,532 16				64		C. L. Sheldon.
Crystal	New Bremen.....	340	707,032	68,692	8,053 94		873	188 85	52		John Darling.
Nathan Clark's	Denmark.....	200	438,759	43,027	5,241 62				57½		Nathan Clark.

Sulphur Spring Factory—No. of cows, 590; lbs. milk, 1,385,652; lbs. of cheese, 144,431; whole amount received for cheese, \$18,558.27; average lbs. of milk to 1 lb. of cheese, 9.59; average sales of cheese per lb., 12.86; expenses of making and furnishing, 1.48 per lb.; net sales of cheese per lb., 11.38; net value of 1 lb. milk, .01123. Season commenced May 7th, and closed Oct. 31st. Cows produced 5 per ct. more cheese in 1872 than for the season of 1871. Decrease in number of cows, 3 per ct.; making the cheese product among Sulphur Spring patrons 2 per ct. more than in 1871.—C. L. SHELDON.
Lowville, N. Y.

Marsell & Gibbs, Deer River—Whole No. of cows, 372; whole No. lbs. milk received, 945,835; whole No. lbs. cheese made, 96,570; whole amount received for cheese, \$12,219.47; average weight of cheese, 62 lbs.; amount of cash divided among the patrons after deducting for manufacturing, furnishing, transportation, telegraphing, expenses of Com., &c., was 10,738.64.—G. B. JOHNSON, Sec'y.

J. Smithling's Factory, Martinsburgh—Whole No. cows, 308; whole No. lbs. milk received, 570,193; whole No. lbs. cheese made, 58,898; whole amount received for cheese, \$7,158.03; average weight of cheese, 6½ lbs.; whole No. lbs. butter made, 2,478; whole amount received for butter, \$560.67.—J. F. SMITHLING, Maker.

Miller's Factory, Constaberville—No. of cows, 900; lbs. milk delivered at factory, 2,318,802; lbs. cheese made, 236,107; received for the same, \$29,812.33; pounds of milk made 1 lb. cheese sold, 9.82; average price received for same per 100, \$12.62½; for making, per 100, \$1; for all expenses, insurance, &c., per 100, 61 cents.

G. D. Ryal's Factory, Harrisburgh—Whole No. cows, 285; whole No. lbs. milk received, 692,947; whole No. lbs. cheese made, 69,364; whole No. lbs. butter made, 1,423; average weight of cheese, 60 lbs.; whole amount received for cheese, \$8,313.34; whole amount received for butter, \$303.

VERMONT.

West Pawlet Dairy Association—We report for the season of 1872, No. of cows, 500; lbs. of milk received, 1,754,351; lbs. cheese manufactured, 180,861; net proceeds at factory, \$23,075.45; average 1 lb. cheese to 9.7 lb. milk; per lb. for cheese at factory, 12¾ cents.—ALLEN WHEDON, Director.

ILLINOIS.

Somonauk Factory—Report of the Somonauk cheese factory for seven months in 1872. Received 1,578,670 lbs. of good sweet milk from 490 Durham cows. Made 159,897 lbs. of green cheese; it took on an average 9.35 lbs. of milk to make one lb. of cheese when three weeks old. The factory earned \$3,197.94 per lb. for making; expense for running the cheese factory is \$1,678.94; profits, \$1,519; material and stock on hand, 140,08; 400 cows average \$62.78 apiece; cheese averaged 14½ cts. per lb.; 15 per cent. on the stock invested. Capital, \$4,500.—ALMON BAKER, Sec'y.

MASSACHUSETTS.

Central Factory, Barre—Capital invested, \$8,000. Commenced April, 1; closed Nov. 30. Amount of milk, 1,678,591 lbs.; milk per one lb. of cheese, 9,825 lbs.; cost of help, including board, \$1248.82; rennets, 144.10; boxes, \$535.64; cloth, \$148.74; fuel, \$136.94; salt, \$68.96. Total expense of getting cheese ready for market, including boxes, \$1.98 per 100 lbs.; freight, \$611.66. Whole amount of cheese, 170,661 lbs. Net income per 100 lbs., \$11.96; net income from whey, 50 cents per 1000 lbs. of milk.

Worcester County Cheese Factory, of Warren—Capital invested, \$5,200. Commenced making cheese April 1; closed Oct. 31. Amount of milk, 1,099,724 lbs.; cheese made, 112,362 lbs.; milk required for one pound of cheese, 9.787 lbs.; net price paid to milk contributors, \$11.98½ per 100 lbs.; cost of manufacturing, 2¼ cents; whole amount of cheese sold, \$15,992.07; amount of money divided among contributors, \$13,463.93. Help of factory, one man and one woman through the season, and one man extra, two months; entire cost of help per month, \$100; value of milk per quart, 2.55 cts.

New Braintree Cheese Factory—Commenced April 2; closed Nov. 29; amount of milk, 1,850,454 lbs. cured cheese, 181,025 lbs.; milk for pound of cheese, 10.22 lbs.; help, one man and one woman all the time, and man and woman four months and twelve days; cost, including board, \$1,438.08; boxes cost, \$677.06; rennets cost \$208.37; total cost of making and getting cheese ready for market, including boxes, \$2.05 per 100 lbs.; net income per 100 lbs., \$11.

CONDENSED REPORTS.

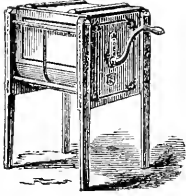
NAME OF FACTORY.	LOCATION.	No. of cows.	Whole number lbs. milk.	Whole number lbs. cheese.	Average price per 100 lbs.	Weight of cheese.	Average milk for 100 lbs. cheese.
Somonauk.....	Somonauk, Ill.	400	1,578,670	159,897	\$14 50	...	9.81
Miller's.....	Constableville, Lewis Co., N. Y.	900	2,318,802	236,107	12 62 ¹ / ₂	...	9.82
Empire.....	E. Pike, Allegany Co., N. Y.	250	756,087	75,690	11 25	...	9.99
McLean.....	McLean, Tompkins Co., N. Y.	700	2,566,344	71,466	13 50	54 ¹ / ₂	9.43
Sulphur Spring.....	Lowville, Lewis Co., N. Y.	590	1,305,652	144,431	12 86	...	9.59
L. F. Central.....	Little Falls, Herkimer Co., N. Y.	405	1,767,064	171,418	13 05	60	10.03
C. W. & J. Smith's.....	Frankfort, Herkimer Co., N. Y.	...	3,459,999	342,018	12 92	...	10.11
Dayton.....	Potsdam, St. Lawrence Co., N. Y.	175	464,054	49,629	13 44	...	9.35
Bethel.....	Bethel, N. Y.	...	1,522,458	154,405	13 21	...	9.86
Manheim Turnpike.....	Manheim, N. Y.	351	1,502,025	147,130	13 17	...	10.20
J. D. Ives'.....	Norway, Herkimer Co.	...	2,537,227	267,929	13 97	...	9.46
South Canton.....	Canton, St. Lawrence Co., N. Y.	900	2,117,956	219,092	13 21	...	9.66
West Canton.....	" " "	600	1,317,745	136,552	12 89	...	9.64
H. D. Hildreth's.....	" " "	300	768,934	79,616	12 89	...	9.64
Whitesboro.....	Whitesboro, Oneida Co., N. Y.	900	3,183,953	313,832	12 99	...	10.14
Week's.....	Verona, Oneida Co., N. Y.	900	3,171,594	320,905	13 20	...	9.88
Union Collins.....	Boston, Erie Co., N. Y.	1,200	3,545,645	355,009	13 13	...	9.98
Simpson.....	New Hudson, Allegany Co., N. Y.	...	1,618,720	173,546	12 00	...	9.33
Tuttle.....	Freetown, N. Y.	...	1,092,927	110,847	12 23	...	9.85
Newville.....	Newville, N. Y.	876	3,279,733	322,821	13 08	...	10.16
Manheim Center.....	Manheim, N. Y.	800	3,114,207	333,975	13 12	...	9.33
Quaker Basin.....	DeRuyter, N. Y.	340	1,177,681	121,567	12 75	...	9.68
Norway Association.....	Norway, N. Y.	450	1,781,621	184,000	13 22	56	9.68
Excelsior.....	Brookfield, N. Y.	...	1,266,347	129,330	12 35	...	9.80
Ward's.....	Holland Patent, N. Y.	400	1,405,758	142,948	13 46	...	9.83
Delta.....	Delta, Oneida Co., N. Y.	900	2,972,005	296,571	13 21	...	10.02
Barre Central.....	Barre, Mass.	...	1,678,591	170,661	13 96	...	9.82
New Brantree.....	New Brantree, Mass.	...	1,850,464	181,025	13 05	...	10.22
Leyden Cheese Associa'n.....	Leyden Hill, N. Y.	520	1,665,240	166,145	12 59	69	10.02
Sugar River.....	" " "	500	1,565,816	155,404	12 11	60	10.07
Houseville.....	Houseville, Lewis Co., N. Y.	650	1,865,222	194,271	12 51	59	9.60
Welsh Hill.....	W. Hill, Turin, Lewis Co., N. Y.	330	654,378	68,616	12 47	55	9.53

Average price of 100 pounds milk, \$1.317.

CREAMERIES.

	Pounds of milk.	Pounds of cheese.	Pounds of butter.	Total lbs. product.	Total receipts.	Average price of 100 lbs. product.	Average lbs. milk for 1 lb. product.
Edmeston, Otsego Co., N. Y.....	2,392,589	181,528	55,334	2,366,862	\$35,089 14	\$14 81	10 10
Crystal, New Bremen, Lewis Co., N. Y.....	707,032	68,692	873	69,565	8,242 79	11 85	10.16
W. W. & A. D. Vorce, Denmark, Lewis Co., N. Y.	705,705	69,583	1,954	71,537	9,091 58	12 71	9.87
Copenhagen, " " "	623,786	59,900	1,107	61,007	7,538 87	12 35	10.22
West Martinsburgh, " " "	1,273,815	125,054	2,751	127,785	15,647 58	12 24	9.96
E. G. Dodge, Martinsburgh, " " "	732,602	75,158	2,363	77,521	9,910 76	12 78	9.45
Lowville, Lowville, " " "	1,881,373	195,738	2,912	198,550	24,337 87	12 25	9.47
South Harrisburgh, " " "	582,163	60,621	1,121	61,742	7,916 13	12 83	9.43

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The quality of this salt for Dairy or other purposes is guaranteed to be equal in all respects to the best English F. F. Salt.

The following is a correct analysis of the Onondaga and Ashton's English F. F. Salt, made by Prof. C. A. Goessman, of the Massachusetts Agricultural College, Amherst, Mass.

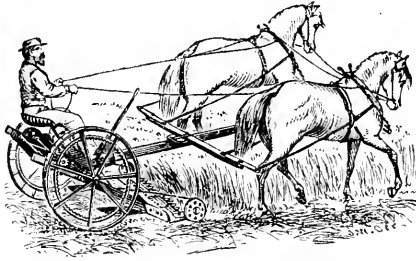
ANALYSIS BY C. A. GOESSMAN, DR. PH.

	Ashton Salt.	Onon. Factory Filled.
Chloride of Sodium.....	97.65	98.28
Sulphate of Lime.....	1.43	0.91
Sulphate of Magnesia.....	0.05	.05
Chloride of Magnesia.....	0.06	.00
Sulphate of Soda.....	.00	.03
Insoluble Matter.....	.05	.12
Water.....	.76	.60
	100.00	100.00

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SYRACUSE, N. Y.

PROCLAMATION.



We proclaim for the information of hay producers that the **DIRECT DRAFT EUREKA MOWER** CANNOT BE EQUALLED by any side cut mower on the following important points:

1st. Time of cutting; 2d. Power expended; 3d. Quality of work, which is the condition of the stubble, and the way the grass is left for curing; 4th. Time of curing the grass—no tedder to be used; 5th. Quality of hay; 6th. Economy of cost in gathering a hay crop; 7th. Durability of machine.

It is highly important to all hay producers who are unacquainted with the Eureka that this fact—THE VERY GREAT SUPERIORITY OF DIRECT DRAFT OVER SIDE CUT—should be settled in their minds by a thorough and exhaustive comparative test trial before competent judges.

Therefore, We, The Wilber's Eureka Mower and Reaper Manufacturing Company, will PRESENT any Manufacturer **\$1000** who will meet us in a trial during the harvest of 1873, and succeed in equaling the Eureka Mower on the above named points by using a Side Cut Mower.

The unsuccessful party to pay all expenses.

ISAAC W. WHITE, President.

Poughkeepsie, N. Y., March 10th, 1873.



This Sink has a bottom (A) sloping from each side to the center which is arranged with a sunken channel (C) running its entire length. Said channel is covered with a movable metallic strainer (B). A spout (D) conducts away the whey as it drains off from the curds in the sink.

WHAT IS CLAIMED FOR THIS SINK:

- 1st. A less cost in construction over other sinks.
- 2d. No recurring expenses for straining cloths or racks.
- 3d. A more pleasant and perfect handling of the curds.
- 4th. The Sink and Strainers are readily kept sweet and clean.

Old Sinks are easily changed to this improvement, with but slight expense.

This Sink was awarded the first award of merit at the New York State Fair, 1871, at Albany. First premiums at all the County Fairs at which it was exhibited, 1871 and 1872.

We are pleased to refer parties interested in the matter to the following persons who have this sink in use:

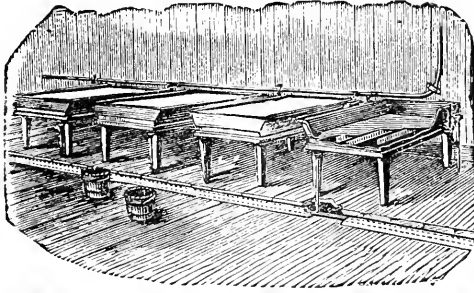
REFERENCES:

Isaac S. Weller, Boonville, N. Y.; Charles C. House, Houseville, N. Y.; C. C. Vroman, Rodman, N. Y.; G. C. Young, Copenhagen, N. Y.; A. G. Stoddard, Lowville, N. Y.; E. A. Ayers, Watertown, N. Y.; James Roberts, Turin, N. Y.; Jones, Faulkner & Co., Utica, N. Y.

Price for right to manufacture and use: Farm dairies, 10 cts per cow; Cheese Factories, 500 cows and under, \$10; over 500 and under 800, \$15; over 800, \$20. Territory and right to sell this invention made known on application. Address

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TOWNSEND & HYDE, Malone, N. Y.

These pans have the great advantage of enabling Butter Makers to keep the milk at the proper temperature for obtaining cream through all changes of weather, thereby producing

MORE AND A BETTER QUALITY OF BUTTER

Than has heretofore been made from the same amount of milk. Also of increasing the net proceeds of the Dairy more than Twenty per cent. The milk and rinse water runs directly from the Pans without being lifted, thereby reducing the labor of taking care of the milk to a mere trifle. They render Butter Factories practicable and profitable, and are adapted to large and small Dairies. The subscriber having purchased of Mr. Jewett the right of this State, is prepared to Manufacture the pans on short notice and reasonable terms.

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