Public documents of the state of Wisconsin ..., for the fiscal term ending June 30, 1908. Volume 6 1906/1908

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PUBLIC DOCUMENTS

OF THE

STATE OF WISCONSIN

BEING THE REPORTS OF THE VARIOUS

State Officers, Departments and Institutions,

For the Fiscal Term ending June 30, 1908.

VOLUME 6

MADISON
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1910

PUBLIC DOCUMENTS

For 1907-1908.

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FIFTH ANNUAL REPORT

OF THE

WISCONSIN

Agricultural Experiment Association

Madison, Wis., Feb. 7, 8, 1907

Address of President, Secretary's Report with Papers and Addresses given by Members of the Association and Others Interested in Progressive Agriculture

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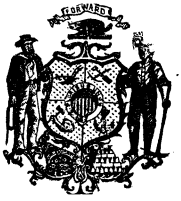
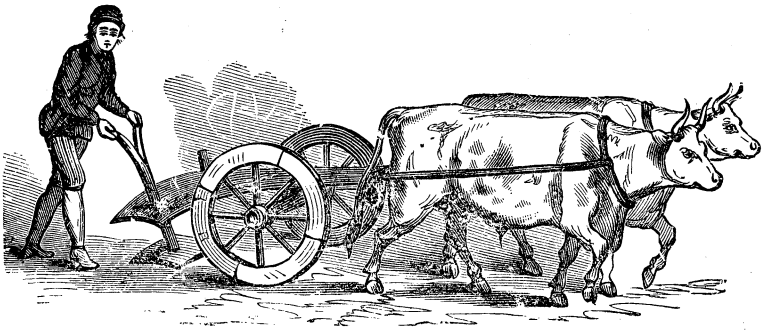
Compiled by

R. A. MOORE, Secretary



MADISON, WISCONSIN:
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1907.



"He who by the plow would thrive,
Himself must either hold or drive."

LETTER OF TRANSMITTAL

WISCONSIN AGRICULTURAL EXPERIMENT ASSOCIATION.

Madison, Wis., 1907.

To His Excellency, JAMES O. DAVIDSON,

Governor of the State of Wisconsin:

SIR—I have the honor to submit for publication, as provided by law, the Fifth Annual Report of the Wisconsin Agricultural Experiment Association, showing the receipts and disbursements the past year, also outlines for experiments, and addresses and discussions given at the annual meeting at Madison, February 7–8, 1907.

Respectfully submitted,

R. A. MOORE,

Secretary.

TABLE OF CONTENTS.

OFFICERS, 1907.

President—A. L. STONE.....Madison
Vice President—H. A. MAIN.....Ft. Atkinson
Secretary—R. A. MOORE.....Madison
Treasurer—H. W. MEEKIN.....Fond du Lac
Clerk and Stenographer—IDALYN BIBBS.....Madison

COMMITTEES.

Program: Officers of the association.

Executive:
E. J. Delwiche.....Iron River, Wis.
Robert Lachmund.....Sauk City, Wis.
O. R. Frauenheim.....Random Lake, Wis.
W. H. Hanchett.....Sparta, Wis.
W. H. Gardner.....Ft. Atkinson, Wis.
Otto Toepfer.....Madison, Wis.

Resolutions:
H. P. Howell.....Sparta, Wis.
A. J. Meyer.....Howell, Mich.
Edwin Trowbridge.....Madison, Wis.
H. A. Main.....Ft. Atkinson, Wis.
H. J. Renk.....Sun Prairie, Wis.

Co-operative Experiments:
Farm Crops.....R. A. Moore.
Bacteriology.....H. L. Russell.

CONSTITUTION AND BY-LAWS.

CONSTITUTION.

Article I.—Name.

This organization shall be known as the Wisconsin Agricultural Experiment Association.

Article II.—Object.

The object of this association shall be to promote the agricultural interests of the state.

1st. By carrying on experiments and investigations that shall be beneficial to all parties interested in progressive farming;

2d. To form a more perfect union between the former and present students of the Wisconsin College of Agriculture, so as to enable them to act in unison for the betterment of rural pursuits in carrying on systematic experiments along the various lines of agriculture;

3d. By growing and disseminating among its constituency new varieties of farm seeds and plants;

4th. By sending literature bearing upon agricultural investigations to its membership, and

5th. By holding an annual meeting in order to report and discuss topics and experiments beneficial to the members of the association.

Article III.—Membership.

Section 1. All former, present and future students and instructors of the Wisconsin College of Agriculture shall be entitled to become members of this association.

Section II. Honorary membership may be conferred upon any one interested in progressive agriculture by a majority vote at any annual or special meeting of the association.

Article IV.—Dues.

A fee of fifty cents shall be collected from each member annually.

Article V.—Officers.

The officers of this association shall consist of a president, vice-president, secretary and treasurer, whose terms of office shall be one year or until their successors are elected.

Article VI.—Duties of Officers.

Section I. It shall be the duty of the president to preside at all meetings of the society and enforce the observance of such rules and regulations as will be for the best interest of the organization; to appoint all regular committees as he may deem expedient for the welfare of the association.

Sec. II. In the absence of the president, the vice-president shall preside and perform all duties of the president.

Sec. III. It shall be the duty of the secretary to keep all records of the association; to report the results of all co-operative experiments carried on by its membership and the experiment station, plan the experimental work as far as possible for the members of the association, and labor for the welfare of the society in general.

Sec. IV. The treasurer shall collect fees, keep secure all funds of the association and pay out money on the written order of the secretary signed by the president. He shall furnish bonds in the sum of two thousand dollars with two sureties, for the faithful performance of his duties.

Article VII.—Amendments.

This constitution may be amended at any annual meeting by a two-thirds vote of the members of the association present.

Amendment No. 1.—Adopted Feb. 9, 1906.

Any person residing within the state having completed a course in agriculture in any college equivalent to that given by the Wisconsin University may become a member of this association under the same regulation as students from the Wisconsin College of Agriculture.

BY-LAWS.

Article I. The officers of this association shall be elected by ballot at the annual meeting.

Art. II. The president and secretary shall be ex-officio members of the executive committee.

Art. III. This association shall be governed by Robert's Rules of Order.

Art. IV. All members joining at the organization of this association shall be known as charter members.

Art. V. The time and place of the annual meeting shall be determined by the executive and program committees.

Constitution adopted and organization effected Feb. 22, 1901.

MEMBERSHIP, 1907.

Aavang, H. O.....Barneveld
Acola, John H.....Madison
Achen, William M.....Bristol
Acker, J. B.....Milton
Adams, R.....Eleva
Aderhold, Herman F.....Athens
Adland, P. H.....North Cape
Adler, William.....Amherst Jct.
Ahlers, Walter.....Grafton
Akins, Clyde E.....Warren, Ill.
Alcalay, S. J. ....New York City, N. Y.
(224 E. 25th St.)
Allen, Chas. L.....Eau Claire
Almon, Perry T.....Weyauwega
Amott, A. L.....Viroqua
Anderson, Adolph W....R. 5, Portage
Anderson, Alvin M.....Whitewater
Anderson, Milo C.....Greenwood
Anderson, Thos. E.....Wild Rose
Anderson, W. H.....Elroy
Andrews, Arthur.....South Wayne
Anthony, D. C.....R. 2, Oregon
Arnold, Cliff B.....Madison
Ashton, A. B.....Janesville
Ashton, Chas. H.....Platteville
Ashton, Lester.....Belmont
Austin, W. B.....Janesville
Austin, W. D.....R. 6, Janesville
Babcock, H. E.....Sparta
Bailey, Earl H.....Elroy
Baker, Dwight.....Blanchardville
Barmore, Trevor J.....R. 5, Monroe
Barr, Ellsworth.....Pine River
Barton, Otto.....Mt. Horeb
Basse, William H.....Milwaukee
Sta. A. R. 4.
Bast, Paul J.....Rockfield
Batten, S. E.....Hudson
Bauffleurs, P. T.....Viroqua
Bechtolt, A. B.....Monroe
Bechtolt, James D.....Monroe
Becker, P. V.....Plymouth
Beebe, A. G.....Bruce
Behrens, Bernhard.....Grafton
Belda, Wm. F.....De Forest
Belderbach, W. F.....Mondovi
Bell, Geo. S.....Madison
Bell, L. L.....Marshall
Bendickson, I. E.....Cambridge
Benedict, A. M.....Mazomanie
Benedict, E. L.....Beloit
Bennett, Arthur F.....Novelty, Ohio
Bennett, Chas. Tu Ranch, Riedel, Mont.
Bennett, J. Harrie.....Mineral Point
Bennett, Herman J.....Belvidere, Ill.
Bennett, Ora.....Glen Haven
Bennett, William.....New Richmond
Benson, Bryant S., Jr.....Genoa Jct.
Benson, Ed. E.....Mt. Horeb
Berg, Julius.....R. 3, Sturgeon Bay
Berry J. G.....Birchwood
Berryman, C. H.....Dodgeville
Bestul, Otto O.....Scandinavia
Beule, E. A.....Fox Lake
Beyer, Herman.....Peebles
Bible, F. O.....Chippewa Falls
Biglow, L. F.....Brooklyn
Bille J.....Waupaca
Birkrem, Clarence.....Deerfield
Birrenkott, M. J.....Klevenville
Bixby, Phil.....Appleton
Blakely, Albert J.....R. 10, Neenah
Blanik, Geo. F.....Algoma
Bleasdale, Jos. R.....R. 5, Janesville
Blessing, J. W.....Fennimore
Blodgett, Gordon.....Neenah
Blonien, Peter.....Elkhart
Blood, Ike.....Mukwonago
Blotz, Elmer.....Dodgeville
Boernke, Rudolph.....Fall Creek
Bohl, Joseph N.....Beaver Dam
Boies, P. R.....Marengo, Ill.

Boll, John C....R. 7, Sheboygan Falls
Bonsack, Herman M.....La Crosse
Bonzelet, J. P.....Eden
Booth, Guy A.....Cuba City
Borden, Herbert....Swedesboro, N. J.
Boucsein, Ernie F....Detroit Harbor
Boucsein, Gus.....Detroit Harbor
Boss, S. J..... R. 7, Oshkosh
Boss, U. C.....R. 7, Oshkosh
Bowden, Chas. B.....West Salem
Boyle, F. E.....Oconomowoc
Bradley, Frank.....Somers
Brady, James F.....Whitewater
Brager, Henry A.....Mt. Horeb
Brandt, Chas. Jr.....West Salem
Briggs, J. W.....Peebles
Brigham, Chas. I.....Blue Mounds
Brindley, T. H.....Newburgh, N. Y.
Bristol, William A.....Oakfield
Brodt, Clarence.....Bridgeport
Bronson, Hans.....Melvina
Brooks, Geo. R..... R. 2, Granton
Brook, J. W.....Salem
Brooks, Joseph.....R. 7, Watertown
Brown, Ed.....West Salem
Bruhn, John F.....R. 3, Mishicot.
Brunson, Levi E.....Rosendale
Bryant, R. J.....Hazel Green
Brye, Lewis O.....Coon Valley
Bryson, Donald.....Elizabeth, Ill.
Buck, Clarence W.....Eldorado
Buck, J. B.....Phillips
Buehler, J. G.....Twin Bluffs
Burce, Ruth E.....Eau Claire
Burgess, E. H.....Bristol
Burnham, D. F.....R. 6, Waupaca
Burr, H. R.....Marshall
Buschman, Hugo.....Forestville
Buss, Will G.....Mineral Point
Bussewitz, Orla J.....Juneau
Bussey, W. P.....Omro
Byerly, Edmund A.....Antigo

Call, H. H.....West Prairie
Callicut, Harry V.....Mineral Point
Cameron, Duncan A.....La Crosse
Campbell, Elsa P...Farmington, Conn.
Campbell, Geo. P.....Augusta
Cannon, E. A.....Pardeeville
Capener, Howard.....Portage
Carey, Henry.....Pine River
Carey, Clinton....Van's Harbor, Mich.
Carmichael, Allen.....Waukesha
Carmody, P. J.....Mt. Ida
Carpenter, Leon A.....Fond du Lac
Carroll, W. P.....New Orleans, La.
Bd. of Trade.
Cass, Leonard.....Viroqua
Caygill, Fred M.....Linden
Cenfield, F. H.....Potosi
Chase, J. P.....Sun Prairie
Chatterton, R. W.....Basco
Cherveny, Wenzel..... Kewaunee
Chetlain, L. A.....Galena, Ill.
Chipman, W. R.....Morrisonville
Chrislaw, A. M..... Rice Lake
Chrisler, Elvin.....R. 1, Lodi
Chrisler, Harley.....Lodi
Christenson, C. Alfred..... Walsh
Christensen, E. W.....Roberts
Christensen, Herman.....Milltown
Christensen, Peter....R. 3, Marshfield
Christiansen, Peter.....Deerfield
Christiansen, W. A....Chippewa Falls
Christoph, Theo.....Chilton
Chrysler, Harvey.....Osseo
Church, Arthur P.....Whitewater
Church, Geo. S.....Allenville
Chynoweth, H. E.....Madison
Clark, Chas. F.....Babcock
Clark, Clarence.....Markesan
Clark, Francis O.....Berea, Ky.
Clark, W. E..... Stevens Point
Clausing, Adolph.....R. 2, Thiensville
Clavadatscher, T.....Sauk City
Clemit, Adolph.....Cambridge
Clusen, Reinhold.....R. 6, Manitowoc
Clow, A. D.....Lodi
Cobb, Homer A.....Sun Prairie
Coldwell, John...R. F. D., Mazomanie
Colenso, J. E....Box 71, Monroe, N. Y.
Collin, D. W.....R. 5, Luxemburg
Conant, W. A.....Manchester, Maine
Cook, Carl.....Mondovi
Coon, Elam P....R. F. D., Milton Jct.
Coon, Leslie.....Osseo
Cooney, Martin.....Corliss
Corneliuson, T.....Eau Claire
Crandall, W. Truman.....Milton
Crane, V. R.....St. Charles Ill.
Cross, A. J.....Allenville
Cross, Roy H.....Davis, Ill.
Curran, William F..... Taylor

Dahle, L. O.....Deerfield
Daley, John K.....McFarland

Dahlen, Melvin O.....Coon Valley
Day, James.....Oakfield
Davis, John.....Platteville
Dean, Robert.....Eleva
Delwiche, E. J.....Iron River
Delwiche, O. J.....Madison
Deneen, Michael,.....Blue Mounds
Dennison, Nicholaus....N. Milwaukee
Dettinger, William F.... Hinsdale, Ill.
Dietrich, John J....Black River Falls
Digman, Fred.....Monroe
Dinnerlein, A. J.....R. 28, Plymouth
Dittmar, William.....Elizabeth, Ill.
Divall, Harry.....Montfort
Dixon, Darley.....Cuba City
Doerfer, Carl.....R. 6, Madison
Donaldson, H. A.....R. 3, Eau Claire
Dopp, Walter H.....Wild Rose
Dougan, W. J.....Beloit
Downey, Stanley.....Whitewater
Downey, Urso J.....Whitewater
Dreger, Emil.....R. 7, Madison
Duerkop, Ernest.....Alma
Dahlin, Melvin O.....Coon Valley
*Dukleth, P. A.....R. 40, Mukwonago
Dunbar, Harold.....River Falls
Dunbar, Harry D.....Elkhorn

Eastman, Frank.....Sheboygan Falls
Eastman, Seth A.....Sheboygan Falls
Ebert, Edmund D.....Tomah
Ebert, Francis E.....Tomah
Ehrhardt, Daniel.....Knowles
Einfeldt, Albert.....Greenwood
Ellickson, A. C.....Arlington
Ellis, V. G.....Evansville
Ellison, Chas. J.....Rubicon
Elver, E. C.....R. 3, Madison
Emery, Geo. Q.....Poynette
Emery, Lyman J.....Oconomowoc
Emery, S. L.....R. 2, Edgerton
Emmert, H. L....R. 2, Johnson Creek
Empey, Geo.....Dorchester
Engel, Philip.....Luxemburg
Engleman, John..... Galesville
Enzenbach, Fred.....Footville
Erickson, Christ.....Ettrick
Erickson, Louis.....Kewaunee
Erickson, Martin.....Leon
Erickson, Ole C.....Detroit Harbor
Ernst, John A.....Milwaukee
(644 7th St.)
(*Deceased.)

Evans, T. H.....Wales
Evans, William H.....Wales
Fadness, John.....Deerfield
Falarsh, Frank.....R. 2, Peshtigo
Farwell, Ray.....Ridgeway
Finsnes, Andrew.....Stoughton
Finstad, Jalmar B.....Bloomer
Fish, Esli.....R. 7, Janesville
Fischer, Louis H.....R. 6, Haven
Fisher, Clayton.....R. 17, Evansville
Fisher J. H.....Janesville
Fisher, Joseph.....R. 17, Evansville
Flanery, W. L.....Berea, Ky.
Fleishauer, Chas.....Arkansaw
Flom, Martin O.....Stoughton
Foley, Robert E.....Wauwatosa
Follstad, Anton.....Elcho
Ford, J. F.....Mazomanie
Ford, Thos. R.....Elgin, Ill.
(357 Chicago St.)
Foster, Carl C.....Fall River
Fox, C. L.....Leon
Fox, E. W.....Madison
Frase, Henry E.....Osseo
Frauenheim, O. R.....Random Lake
Frederickson, Fred.....Spring Green
Freeman, Geo. A.....Sparta
Freeman, Roy F.....R. 4, Racine
Frelich, Albert.....Kellnersville
Fritz Mark.....Belleville
Fruit, Bert L.....Platteville
Fulton, W. A.....Bangor

Gabrill, E.....Evansville
Gallagher, Frank..... Reedsburg
Gangstad, Herman O.....Deerfield
Gangstad, J. O.....Deerfield
Gardner, W. H.....Solon Mills
Garside, Harry R.....Cedar Grove
Gelbach, Parke R.....Lancaster
Germann, Henry L.....Brackett
Ghastin, William J.....Twin Bluffs
Gibbard, P. J.....Ripon
Gillette, R. A.....Verona
Gimry, Henry....Grovertown, Indiana
(R. F. D. 1.)
Ginter, Joe.....R. 3, Reedsville
Glindinning, H. L.....R. 2, Shullsburg
Gloecklie, Theodore.....Portage
Goetsch, Albert A.....Juneau
Gordon, Archie L.....Mineral Point
Gordon, J. Roy.....Mineral Point
Graper, Edwin J.....R. 1, Helenville
Graves, E. H.....Madison

Grebe, Fred P.....Fox Lake
Greengo, A. L.....Menomonee Falls
Griffith, Jas.....Spencer
Grimstad, Alvin C.....Barneveld
Grimwood, Ivan J.....Bristol, Ill.
Griswold, H. W.....West Salem
Gross, Waldo E.....Merrimac
Grove, Christian.....Columbus
Gruhle, W. H.....R. 2, Barton
Gueldner, William.....Mondovi
Gullickson, Chas. E.....Cushing
Guptill, L. R.....New Auburn
Gustafson, Theo.....Stockholm

Haass, Otto.....Merton
Hackett, Chas. H.....R. 6, Baraboo
Haevers, Martin.....R. 4, Luxemburg
Hagestad, Andrew C.....Ettrick
Haines, Joseph K..Mt. Ephraim, N. J.
Halbert, J. H.....Augusta
Halvorson, Theo.....Whitewater
Hamann, Edgar.....R. 1, Sheboygan
Hamilton, T. S.....Westfield
Hanchett, W. H.....Sparta
Hansen, Harry.....Box 14, Fontenoy
Hansen, Helmer.....Scandinavia
Hansen, Ole C.....Detroit Harbor
Hanson, Elmer.....R. 1, Waupaca
Hanson, N. P.....R. 1, Amherst Jct.
Hanzlik, David E.....Wonewoc
Hanzlik Otto J.....Wonewoc
Hardy, John.....Wauwatosa
Harr, Ernest.....R. 3, Bangor
Harriman, Fred E., Jr.....Shawano
Harrington, C. L.....Verona
Harris, Jesse S.....Delavan
Harris, Roy T.....Madison
Harris, Ruthven E.....Warrens
Harrison George.....Omro
Haskin, I. O.....Prairie du Sac
Hass, Reinhold A.....R. 1, La Crosse
Hasselkus, Erwin H..Milwaukee, Wis.
(Care Carrier 42 Sta. Main.)
Hasselquist, William.....Munda, Ill.
Haskins, Leon.....Montello
Hatch, K. L.....Winneconne
Hatch, L. M.....Chapin, Iowa
Haus, Enoch.....Rice Lake
Haverly, H. L.....Victory
Hebert, L. P.....Chippewa Falls
Hegge, E. A.....Pigeon Falls
Heidemann, Otto C.....R. 2, Kiel
Heinke, Alvin.....New London
Heldstab, C. O.....Rice Lake
Hemker, Fritz F.....La Crosse
Hemker, Fritz. H.....West Salem
Hendrichs, Lewis F....Campbellsport
Herdrich, Sam.....R. 19, Adell
Herold, Rudolph.....Stoddard
Hessel, Louis.....R. 6, Manitowoc
Hetts, Eugene.....Ft. Atkinson
Hetts, J. D.....Ft. Atkinson
Heuer, E. F.....Wautoma
Heyroth, Louis H.....Mishicot
Hicken, Alfred B.....Pewaukee
Hicks, Earl L.....Pepin
Hildemann, E. S.....Belle Plaine
Hill, Chas. L.....Rosendale
Hill, Otto C.....Mt. Horeb
Hillier, H. B.....Waunakee
Hine, Geo. S.....Fairchild
Hinz, A. F.....Ripon
Hirsch, B.....Washburn
Hitchcock, Homer.....Pecatonica, Ill.
Hixton, Will.....Hixton
Hjelle, Ole K.....Soldiers Grove
Hoague, Charles.....R. 7, Janesville
Hoefner, H. C.....R. 1, Manitowoc
Hoefner, William.....R. 2, Manitowoc
Hoffman, John.....Clintonville
Holcomb, W. R.....Elkhorn
Holloway, John W.....Union Grove
Holman, Ray M.....Waupaca
Holscher, A. C.....Cottage Grove
Hopkins, B. F.....Morrisonville
Hopkins S. J.....Paoli
Hougan, O. O.....Stoughton
Houkom, Stephen.....Blair
Houser, Walter.....Mondovi
Houslet, Neal.....Packwaukee
Howard, A. E.....Whitewater
Howard, Geo. A.....Ft. Atkinson
Howe, Louis H.....Brodhead
Howell, Horace P.....Sparta
Howitt, C. H.....Randolph
Howland, W. L.....Waupun
Hoyem, S.....Eau Claire
Hoyt, J. Warren.....Rosendale
Hubbard, E. S.....Norwalk
Hubbard, Sherman..R. 18, Evansville
Hudson, W. D.....Reedsburg
Huebsch, L. A.....Lake Forest, Ill.
Hustad, Martin C. T.....Modena
Illian, W. L.....R. 19, Adell

Imholt, B. A.....Houlton
Imig, Arthur H.....Neillsville
Inman, R. G.....Avalon

Jacklin, Ben. Jr.....Redgranite
Jacklin, Harley.....R. 1, Redgranite
Jacky, Gilbert.....R. 39, Malone
Jacky, H. L.....R. 39, Malone
Jacobs, A. F.....R. 1, Coloma Sta.
Jacobs, O. J.....Coloma Sta.
Jacobson, F. E.....Oconomowoc
Jacobson Iven.....Clinton
Jacobson, Louis M.....Clinton
Jacot, Oscar.....Eleva
Jahn, Chas.....Cream
Jahnke, Herman F.....Regina
Jahnke, J. F.....Pepin
Jamison, Robert.....Appleton
Jamison, W. G.....R. 2, Appleton
Jante, Henry H.....Milwaukee
(Sta. A., R. 4.)
Jaquish, J. E.....Twin Bluffs
Jeffery, H. B.....Menomonee Falls
Jenkins, Robert.....Wales
Jens, Otto A.....R. 9, Waukesha
Jensen, Peter.....Argyle
Jewett, Harry.....Bangor
Jirtle, Geo. B.....Algoma
Johnson, Albert I.....Bloomer
Johnson, Billie.....Strongs Prairie
Johnson, Chas. G.....Clintonville
Johnson, Geo.....Cataract
Johnson, Henry W.....Woodford
Johnson, Thos.....Westby
Joice, George.....Waterloo
Jones, Albert.....Dousman
Jones, E. E.....Rockland
Jones, E. R.....Madison
Jones, John G.....Beaver Dam
Jones, John R.....Columbus
Jones, Owen Jr.....Beaver Dam
Jones, T. C.....R. 9, Watertown
Joos, Frank B.....Fountain City
Jordalen, Clarence.....Stoughton
Jung. A. E.....Randolph
Jungbluth, William J.....Milwaukee
(R. 5, Sta. A.)

Kaltenberg, Anthony.....Waunakee
Katel, William.....R. 1, Kewaunee
Keeney, E. R.....Rockton, Ill.
Keir, S. M.....Viroqua
Kendall, Myron.....R. 3, Iola
Kendall, V. F.....R. 3, Iola
Kent, H. W.....Rusk
Kent, J. S.....Rusk
Kieffer, J. C.....Auburndale
Kieffer, Michael.....Fredonia
Kimble, N. G.....Milton Jct.
Kindschy, George.....Waumandee
Kircher, H. W.....Chilton
Kirchman, J. A.....Algoma
Kitchen, Jos. H.....Edmund
Klann, Adolph.....R. 1, Hayton
Kloehn, Irvin G.....Pickotts
Klofanda, Ruben.....R. 1, Racine
Klovdahl, John J.....Wittenberg
Kluck, F. E.....Lena, Ill.
Kluck, Roy E.....Lena, Ill.
Klussendorf, Fred....R. 1, Neillsville
Kneipp, William.....Weyauwega
Knoke, E. A.....Shiocton
Kohlwey, Otto.....Grafton
Kohne, Henry.....Little Suamico
Koll, C. A.....Eau Claire
Koltes, J. F.....Dane
Konz, John Sr.....Fairchild
Kramer, H. F.....Bloomer
Kramer, John Jr.....Montfort
Krase, Henry.....R. 1, Two Rivers
Krause, Edward H.....Ripon
Krogstad, Oscar J....R. 1, Eau Claire
Kronholm, V. E.....Grand Rapids
Krueger, Alexander...R. 2, Watertown
Krueger, Henry E.....Beaver Dam
Kruse, William.....R. 4, Whitewater
Kuehn, Chas. A.....Brandon
Kurtz, Chas. J.....Saukville
Kurtze, Otto O.....R. 15, West Allis

Lachmund, Robert.....Sauk City
Lam, Sam.....Ferryville
Lannon, James H.....Lyndon Sta.
Larsen, Elmer J.....Waupaca
Larsen, L. T.....Viroqua
Larson, J. M.....R. 1, Wautoma
Larson, Le Roy.....Iola
Larson, Ole E....R. 2, Caldwell, Idaho
Larson, T. D.....R. 2, Cambridge
Larson, W. B.....Ogdensburg
Lawrence, Floyd.....West Salem
Lawrence, W. J.....De Soto
Lawton, A. R.....Viola
Lean, R. J.....Elkhorn
Lebeis, F. J.....Bloomer
Lee, E. W.....Granton

Lee, Severt, A.....Deerfield
Lee, T.....Klevenville
Lefler, Jos.....Marshfield
LeGresley, Norris.....Chicago, Ill.
(274 N. Clark St.)
Lehmann, T. A.....Watertown
Leonard, Mike.....Plymouth
Lerverenz, Roy B.....Tomahawk
Letts, Edward.....Appleton
Leverich, J. W.....Sparta
Lewis, E. H.....Whitewater
Ley, John T.....Dodgeville
Liebzeit, Albert E....Sheboygan Falls
Lindberg, Emil,.....Itasca Sta.
Linde, Charles.....Madison
Lindwig, K. T.....Westby
Linse, Chas.....La Crosse
Lloyd, Evan B.....Cambria
Lloyd-Jones, Charles.....Hillside
Lloyd-Jones, Orren.....Hillside
Lloyd-Jones, Scott.....Hillside
Loeve, Arthur.....R. 8, Milwaukee
Logan, R. G.....Junction City
Longanecker, Elmer..Cerro Gordo, Ill.
Longley, A. E.....Dousman
Longley, Harvey N.....Dousman
Loomis, C. W.....Wauwatosa
Loomis, George E.....R. 3, Mondovi
Lowell, Lloyd S.....Sharon
Lund, Edwin.....Bloomer
Lunde, K. I.....Edgerton

Maeder, J. W.....R. 3, Oregon
Mahoney, David.....Juneau
Main, A. G.....Hortonville
Main, H. A.....Ft. Atkinson
Malde, O. G.....Madison
Mang, Arthur J.....Ripon
Marck, Fred R.....R. 1, Honey Creek
Marck, L. G.....R. 1, Honey Creek
Markey, Walter.....Sullivan
Markey, W. E.....Sullivan
Markham, F. C.....Independence
Markham, Fred.....Independence
Marshall, R. R.....Madison
Marshall, W. S.....Delton
Marston, Albert.....Beloit
Martin, H. A.....Gotham
Marty, Mathias.....Monticello
Mathews, Milton D.....Helenville
Mathis, Adolph....R. 1, Lansing, Iowa
Mattison, Thos.....Blair
Mau, H. J.....Brodhead
McConnell, R. E.....Tomah
McIntyre, Ivan.....Ft. Atkinson
McNown, J. H.....Mauston
Meekin, Hamilton W....Fond du Lac
McRandles, J.....R. 5, Waukesha
Melby, Dan.....Madge
Melvin, R. B.....Glenbeulah
Merkel, Henry.....Appleton
Merrill, Waldo M.....Taylor
Meurer, Paul Jr.....Genoa Jct.
Meyer, A. J.....R. 7, Howell, Mich.
Meyer, E. J.....Tomah
Meyer, John.....R. 7, Madison
Michels, Henry.....R. 39, Malone
Michels, Matthew.....Madison
Mielke, J. E.....Basco
Mikkelson, Carl.....Deerfield
Millar, Will.....Menomonie
Miller, Guy E. Jr.,.....Markesan
Miller, Henry C.....Allenville
Miller, Orin.....Pickett
Miller, Theo.....Greenwood
Miritz, O. F.....Fond du Lac
Mitchell, J. T.....Cottage Grove
Mitwede, Henry.....Waukesha
Mjelde, Louis.....Amherst
Moe, A. J.....Holmen
Moen, Geo. O.....Cambridge
Moen, Gilbert T.....Eleva
Moen, Herman.....Cambridge
Moergeli, Henry.....Washburn
Molley, Martin.....Ontario
Monroe, Royal.....R. 3, Fond du Lac
Monroe, S. Ferris....R. 12, Rosendale
Monson, Chris.....Five Points
Moore, R. A.....Madison
Morgan, Chas.....Albany
Morse, W. A.....Camden, N. Y.
Moseley, Raymond W.....Madison
Motz, Walter.....Colgate
Muehleisen, Gottlieb.....Alma
Mueller, Edw. O.....R. 1, Appleton
Mulcahy, J. W.....Belmont
Mulder, B. N.....Midway
Mullen, Timothy.....Watertown
Murdock, Clayton.....Brodhead
Murkley, H. D.....Berlin
Muth, E.....Sheboygan
Muttleman, Fred.....West Salem
Myrick, M. O.....R. 2, Bristol

Nathen, Paul R.....Kendall
Neilson, Wm. C..R. 10, No. Milwaukee
Nelson, A. M.....Spring Valley
Nelson, Edwin.....Viroqua

Nelson, Martin.....Milton
Nelson, O. P.....R. 2, Cambridge
Nelson, P. C.....Milltown
Nelson, T. E.....Ferryville
Newhouse K. K.....Clinton
Nicholls, Henry.....Stoughton
Nicolaus, C. A.....Waukesha
Nicolaus, D. C.....East Troy
Nies, Peter.....Greenleaf
Norgord, C. P.....Madison
Norsman, Jerome O.....Madison
North, George.....White Hall, Ill.
Northrup, J. V.....Waupun
Noth, F. A.....Norwalk
Noyce, Elmer J.....Oregon
Nyre, L. A.....Mondovi

Ochsner, Arthur.....Plain
O'Connell, J.....Hartford
O'Connor, Edward F.....Lodi
Oldenburg, Gustav H..Bailey's Harbor
Oleson, Harry.....Larsen
Oleson, Janes P.....R. 13, Ripon
Oliver, C. S.....Eau Claire
Oliver, James H.....Galesville
Olson, G. C.....Westby
Olson, Otto W.....Walsh
Olson, William.....R. 2, Browntown
Orell, Leo J.....R. 4, Algoma
Orth, Alf. F.....Muscoda
Osborne, John F.....Linden
Osborne, W. F.....Linden
Osterday, E. G.....Stockton, Ill.
Owens, Herbert C.....Fox Lake

Pabst, Fred.....Milwaukee
Palmer, Howard.....Platteville
Parrish, J. O.....Plymouth
Parsch, Gustav A.....Stoddard
Parsons, W. A.....Ft. Atkinson
Patterson, Roger H.....Durand, Ill.
Patterson, J. L.....Glen Haven
Paulson, Gust.....Clayton
Paulson, Hilbert.....Hollandale
Paulson, P. A.....Hudson
Pauly, H. J.....Milwaukee Wis.
(207 14th, St.)
Peck, Henry M.....Marshall
Pederson, Peter.....Eleva
Peck, Edmund.....R. 4, Chilton
Peterka, Jos.....R. 7, Racine
Peters, Ezra.....Sharon
Peterson, A. J.....R. 31, Bristol
Peterson, August.....Amery
Peterson, Chas. A.....Orange
Peterson, C. T.....Grantsburg
Peterson, E. C.....R. 4, Whitewater
Peterson, Henry N.....New Holstein
Peterson, O. P.....Blair
Peterson, Perry O.....Amherst
Peterson, Theo. A.....Orfordville
Peterson, William.....Curtiss
Phillips, F. N.....Wyocena
Phillips, Jesse.....Elizabeth, Ill.
Phillips, Sidney.....Eldorado
Pierner, Fred....R. 11, No. Milwaukee
Pierner, John W.....Thiensville
Pinkerton, A. J.....Waupaca
Pirner, John Jr.....R. 3, New London
Pitt, Ernest H.....R. 1, Whitewater
Poellman, M. J.....Granville Sta.
Pollock, Wilbur.....Lake Villa, Ill.
Pope, N. J.....R. 2, Iola
Port, Michael.....Port Washington
Porter, Jos. K.....Evansville
Porter, W. B.....Evansville
Post, Harry L.....Sextonville
Poston, R. H.....Duluth Minn.
Potter, Guy.....Grand Rapids
Poulter, C. J.....Cumberland
Prescott, J. S.....Deerfield
Pritchard, John T.....Waukesha
Pu's, John.....R. 4, Hartford

Raether, Louis J.....Algoma
Raichle, Wil'.....Galesville
Rasmussen, Gordon S.....Franksville
Ray, W. F.....R. 1, Kewaunee
Reed, James O.....Madison
(614 Langdon.)
Rehbein, A. E.....R. 1, St. Croix Falls
Reindahl, A. K.....Madison
Reinheimer, William.....Spencer
Renk, Henry.....Sun Prairie
Renk, William.....Sun Prairie
Rhodes, Louis.....Kansasville
Rice, C. A.....Milton
Richardson, L. C.....Oregon
Riederer, Blasius.....Cato
Riek, Anthony.....Spring Green
Ristau, Edward.....Osseo
Risum, Louis E.....Brodhead
Roberts, F. W.....Woodworth
Roberts, R. E.....Corliss
Roberts, Thomas J.....Randolph
Roberts, William E.....Randolph
Robertson, R. B.....Tomah

Roeckel, Jos. P.....Lark
Roethel, Herman.....R. 2, Kiel
Roffers, John H.....R. 7, Green Bay
Rood, M. C.....So. Wayne
Rood, O. C.....So. Wayne
Rorer, William A.....New York City
(42 Broadway.)
Rosenow, Arthur.....Oconomowoc
Rosenow, H. E.....Oconomowoc
Rosenow, H. G.....R. 1, Waumandee
Rosenow, L. J.....R. 1, Waumandee
Rowlands, R. W.....Waukesha
Royston, Thomas.....Mazomanie
Ruggles, Wm. Guy.....Ridgeway
Rundahl, J. K.....Coon Valley
Runde, Martin C.....Cuba City
Rundell, Dale E.....Livingston
Rundell, Wilbur M.....Livingston
Ruskell, Emmet.....Belmont
Russell, A. C.....Augusta
Rust, Shirley.....Mukwonago
Ruste, C. O.....Blue Mounds
Ryan, Malachi.....So. Kaukauna

Salzman, Ed.....Kiel
Sanborn, E. H.....Madison
Sandman, W. D.....Holmen
Savage, Alb. F.....Quincy, Fla.
Saxe, William.....Baraboo
Schaefer, Henry G.....Plymouth
Schaefer, R. J.....Appleton
Schafer, Chas. H.....R. 7, Waukesha
Scheid, Byron.....Bay City
Schiller, Claude E..R. 4, Beaver Dam
Schlopman, F. W..R. 10, N. Milwaukee
Schlotz, Geo.....R. 2, Turtle Lake
Schmit, Alois E....R. 22, Hortonville
Schmit, A. N.....R. 2, Appleton
Schmit, A. W.....Appleton, R. 2
Schmit, George.....R. 16, Greenville
Schmit, John A.....Hortonville
Schmit, Peter.....Granville
Schneller, Geo. L.....Plain
Schoenhorster, Henry.....Pra. du Sac
Scholze, Theo. A.....Sparta
Schottler, Conrad J...So. Germantown
Schroeder, F. C....Washington, D. C.
Bureau of Soils
Schroeder, H. F.....West Bend
Schroeder, Herman F.....Milwaukee
(Sta. D. R. 3.)
Schulte, W. L.....Garnavillo, Iowa
Schultz, Edwin W.....Brownsville
Schultz, Walter W.....Neillsville
Schwandt, William.....Stanton
Schwantes, Ernst E.....Two Rivers
Schwartz, J. A.....Troy Center
Schwartz, Walter W.....Troy Center
Scribner, F. H.....Rosendale
Semb, T. A.....R. 6, Madison
Sharpe, Chas. E.....Waldo
Sharpee, Endre A.....R. 1, Rio
Sharpee, J. A.....Rio
Sharpee, P. H.....Rio
Shawere, E. W.....Cottage Grove
Sheldon, Ben F.....Brandon
Shultis, A. D.....Waukesha
Siegert, A.....Appleton
Siegert, Jos.....Granville
Siemers, Edward.....R. 1, Cleveland
Sievers, George...R. 9, No. Milwaukee
Simonson A. W.....Racine
Skoglund, Louis.....Amherst
Smiley, James B.....Albany
Smith, E. B.....Beaver
Smith, H. Burns.....Brooklyn
Smith, John F.....Darlington, R F. D.
Smith, J. G.....Farmington, Minn.
Smithwick, Martin....R. 6, Kewaunee
Snyder, H. A.....Oxford
Snyder, K. B.....Clinton
Solverson, Oscar.....Viroqua
Somerville, Robert.....Melrose
Sorenson, Albert E.....Osceola
Sorenson, Hilbert.....Franksville
Southcott, Fred.....R. 1, Wauwatosa
Spaulding, C. F....R. 26, Oconomowoc
Spaulding, Leslie.....Mondovi
Spaulding, Willis H.....Oconomowoc
Stamm, G. A.....Modena
Stauffacher, A. J.....R. 6, Monroe
Steidtmann Edwin.....Prairie du Sac
Steiner, William.....Brownsville
Steinhoff, Walter J.....Platteville
Steuber, L. J.....Lodi
Stevenson, Carl.....Soldiers Grove
Steward, Chas. A.....Fox, Ill.
Stevenson, J. W.....Rice Lake
Stewart, Geo. L.....Lodi
Stewart, Howard.....R. 2, Delavan
Stewart, J. R.....Verona
Stewart, J. W.....Blanchardville
Stienstra, Samuel....Swedesborg, Mo.
Stivarius, Geo. A.....R. 4, Fennimore
Stone, A. L.....Madison
Strader, W. E.....Augusta
Straig, Frank.....Stone Rock

Straka, Edward E.....Kellnersville
Stratton, J. W.....Waupaca
Streeton, Jabez.....Bangor
Streeton, Enos.....Bangor
Strommen, M. A.....Cambridge
Stroup, Fred G.....Fond du Lac
Strowig, William A....R. 1, Cleveland
Suhr, Adolph A.....Cochrane
Suhr, Otto A.....Cochrane
Sullivan, James A.....Grimms
Sullivan, J. J.....Forestville
Swalem, P. O.....DeForest
Swan, L. W.....Mukwonago
Swan, N. J.....Wauwatosa
Swenson, Gust.....Deerfield
Swenson, O. S.....Amherst Jct.
Swoboda, Frank G.....Dousman
Sylvester, Walter W.....Seymour

Tear, E. J.....Eau Claire
Tenney, Horatio A.....Calamine
Tesch, Arthur.....Seymour
Thacker, Ed. T.....Zenda
Thackray, Joseph....R. 30, Glenbeulah
Thackray, T. H.....Glenbeulah
Thiege, Edward G.....Viroqua
Thiege, Karl.....Viroqua
Thiege, M. G.....R. 4, Westby
Thielke, Ed. A.....R. 2, Cleveland
Thieleke, F. F.....Kiel
Thiers, L. M.....Kenosha
Thomas, Roy E.....Dodgeville
Thompson, Alfred N....R. 1, Delavan
Thompson, Melvin.....Mt. Horeb
Thompson, R. K.....Bottineau, N. D.
Thompson, Thor, Jr....Wadena, Iowa
Thompson, Theo.....Curtiss
Thorstad, Nels H.....Deerfield
Thulin, Edwin.....Hayward
Tibbets, William.....North Bend
Tice, Ray.....Redgranite
Tiesburg, S. H.....Stoughton
Toepfer, Otto F.....R. 7, Madison
Tomkins, A. Pearce.....Ashland Jct.
Tomkins, O. Scott.....Ashland
Toole, W. A.....Baraboo
Torgenson, Benj. S.....Cottage Grove
Treleven, Guy.....Omro
Tressler, D. R.....Edon, Ohio
Tretsven, Oscar.....Milltown
Trow, Edw. J.....Oregon
Truesdale, Thos S.....Cillingham
Turgasen, John H.....Richland Ctr.

Uhlin, Frank E.....Clayton
Usher, Earl.....South Wayne

Van Buren, Ed.....R. 2, Waukesha
Van Buskirk, G. W.....R. 1, Plover
Vandercook, R. I.....Linden, Mich.
Vaughn, Dayle W.....Whitewater
Vinger, Geo.....Argyle
Vinger, Milo J.....R. 2, Argyle
Vollmer, Theo. F...Sta. D, Milwaukee
Volz, Robert.....Ablemans
Vonder Ohe, Wm. H.....Reedsburg
Von Lanyi, Oscar.....R. 2, Edgerton
Vosberg, Henry.....Hazel Green
Voss, William.....Mazomanie

Wagner, J. M.....Union Center
Wahler, Adolph.....Woodford
Walker, R. C.....Plainville
Wall, Floyd.....Weyauwega
Wall, William.....Weyauwega
Ward, W. R.....Ft. Atkinson
Warner, R. C.....Whitehall
Waterstreet, William....Spring Green
Wayne, Joseph.....Boscobel
Weisman, Paul.....Bridgeport
Welles, M. L.....Rosendale
Welsh, S. L.....Tavera
Welton, Seth.....Woodford
Wernich, A. C.....Morrisonville
Wernich, William H.....DeForest
West, Mark H.....Elkhorn
West, R. N.....Ripon
Weston, A. W.....Audubon, Iowa
Weston, John.....Burnett
Whelan, J. V.....Mondovi
Whitby, Arthur J.....Chilton
Wiegand, O. R.....Cleveland
White, Glenn.....La Crosse
Whitehead, H. W.....Leon
Whitnall, H. E.....Milwaukee
(573 Lake Drive.)
Whittaker, Horace.....Fond du Lac
Whittemore, H.....Brandon
Wichern, Carl W.....Baraboo
Wick, William F.....Mauston
Wiegand, O. R.....Cleveland
Wilhelmsen, Hartwick.....Ixonia
Wilkins, Chas.....Livingston
Wilkinson, Edw.....Wilton
Wilkowske, R. T.....Mishicot
Williams, A. R.....Waukesha
Williams, D. T.....R. 8, Waukesha

Williams, David W.....Genesee Depot
Williams, John A.....Waukesha
Williams, L.....Green Bay
Williams, M. G.....Potosi
Williams, Orson J.....Waukesha
Wilson, William C.....Burlington
Winegar, A. B.....Madison
Winge, William.....Wautoma
Winter, L. H.....Eau Claire
Wismer, Herman.....Larsen
Wold, Oscar.....Eleva
Wrabetz, Frank.....R. 6, Madison
Wright, Geo. T.....Eau Claire
Wright, John.....Whitewater
Wright, Wray C.....Eau Claire
Wueff, Fred.....Grafton
Wussow, Chas. A.....R. 35, Seymour
Wyatt, Ray L.....Tomah
Young, Harry.....Bridgeport
Zabel, Ed.....Deerfield
Zahrt, F. H.....Hortonville
Zerbel, Lewis R.....Madison
Zeller, Louis.....Waumandee
Ziemer, Fred.....New London
Zwicky, J. D.....Scandinavia

HONORARY MEMBERS.

Ames, W. L.....Oregon
Babcock, Dr. S. M.....Madison
Cary, Prof. C. P.....Madison
Emery, Prof. J. Q.....Madison
Harvey, Prof. L. D.....Menomonie
Hays, W. M., Ass't Secretary Agr. Washington, D. C
Henry, Dr. W. A.....Madison
Hitt, Hon. H. D.....Oakfield
Hoard, Hon. W. D.....Ft. Atkinson
Karel, Hon. L. A.....Kewaunee
Lehmann, Mrs. Eva.....Neosho
McKerrow, Supt. Geo.....Pewaukee
Newman, Geo. N.....Ladysmith
Philips, A. J.....West Salem
Renk, Katharine.....Sun Prairie
Toole, William.....Baraboo
True, Hon. John M.....Madison
Utsunomiya, S. T. Sapporo, Hokkaido Japan.
Whitmore, Mary.....Janesville

SIXTH ANNUAL MEETING

OF THE

WISCONSIN AGRICULTURAL EXPERIMENT ASSOCIATION.

The officers and members of the Association extend a cordial invitation to all interested in progressive farming to attend its meetings and take part in the discussions.

PROGRAM.

Thursday, Feb. 7th, 9 A. M. Room 61.

Annual Address of President.....A. L. Stone
Secretary's Report.....R. A. Moore
Farmer's Organization Aided by the Members of the Experiment Association.....W. H. Hanchett
Opportunities for Young Farmers in the West.....E. W. Lee
Rural Telephones.....H. E. Rosenow
Elements of Success on the Farm.....W. L. Ames
Soy Beans as a Wisconsin Forage Crop.....Arthur Ochsner

Thursday, 2 P. M. Auditorium.

Election of Officers, Reports of Committees, etc.
Plan of Work for the Coming Year:
Division of Farm Crops.....R. A. Moore
Division of Bacteriology.....Dr. H. L. Russell

Address.....Dr. H. E. Horton
The Wisconsin Experiment Association as a Distributor of Agricultural Thought.....Prof. G. F. Snyder
Cooperation of the Short Course Alumni with the Wisconsin Experiment Association.....E. E. Jones
The Agricultural Press and the Wisconsin Experiment Association.....A. J. Meyer
Address.....Chas. L. Hill

Papers, Discussion and Cooperative Tests with Seed Corn for the Season of 1906.

The Importance of the Corn Crop for Wisconsin Farmers.....W. S. Marshall
A Good Rotation for the Corn Crop of Wisconsin.....H. A. Main
Preparation of the Ground for Corn and Subsequent Cultivations.....Martin Smithwick
Testing Seed Corn and Planting.....Guy Treleven
Selecting and Cutting Seed Corn.....W. A. Toole
Varieties of Corn for Wisconsin.....O. R. Frauenheim

Friday, 8 A. M., Room 61.

Memorial Address.....A. J. Philips
Official Tests of Dairy Cows.....Roy T. Harris
The Farmer of Today, his Ability and Responsibility.....Mrs. Eva Lehmann

Cooperative Variety Tests of Corn:
Silver King (Wisconsin No. 7).....Ike Blood
H. W. Griswold, H. A. Main, H. L. Post, Arthur Rosenow, C. C. Hoague, Clarence Jordalen, E. A. Beule, P. J. Bast, Fred P. Grebe, J. D. Bechtolt, W. A. Parsons, C. F. Spaulding, H. B. Hillier.
Wisconsin Yellow Dent No. 8.....H. W. Meekin
O. R. Frauenheim, E. J. Delwiche, O. J. Krogstad, R. N. West, O. C. Erickson, G. A. Freeman.
General Discussion.

Cooperative Variety Tests of Alfalfa:
Phil. T. Bixby, A. C. Russell, William F. Renk, C. E. Fisher, J. D. Bechtolt, E. E. Wyatt, George North, J. G. Buehler, A. Einfeldt, E. L. Hicks.

Friday, 2 P. M. Auditorium.

Barley.

Importance Compared with Other Crops of Wisconsin....J. S. Harris
Establishing Barley Centers in Wisconsin.....R. A. Moore
Testing the Seed and Sowing for the Season's Crop....Ivan McIntyre
Treating the Seed for the Prevention of Smut.....A. L. Stone
Harvesting and Threshing.....L. R. Zerbel
Marketing the Crop.....Otto Toepfer
Cooperative Work with U. S. Department of Agriculture.C. P. Norgord

Cooperative Experiments with Oderbrucker Barley.

H. A. Main, J. P. Bonzelet, H. J. Renk, H. O. Aavang, P. A. Dukleth, P. C. Nelson, Clarence Clark, H. E. Krueger, Robert Jamison, I. J. Grimwood, H. D. Dunbar, Anthony Riek, A. Liebzeit, J. O. Gangstad.

General Discussion.

Friday, 7:30 P. M. Auditorium.

Joint Session of the Experiment Association, Short Course Alumni and Short Course Literary Society. Long Course and Farmer Course Students invited to attend.

Music.....Elsie Fehlandt and Elizabeth O'Grady
Oration.....Joseph Fisher
Duet "The Wood-Bird's Song".....Mary and Walter Moyle
Address.....Hon. W. D. Hoard
Selection.....Dorothea Moll
Vocal Solo.....Rev. F. T. Galpin
Selection.....Mary Moyle
Address—"Scientific Research." How Made Most Valuable to the Farmer.....Prof. L. D. Harvey
Duet—"Do you Remember".....Mary and Walter Moyle

FIFTH ANNUAL REPORT

OF THE

Wisconsin Agricultural Experiment Association

PRESIDENT'S ANNUAL ADDRESS.

A. L. STONE, MADISON, WIS.

Fellow Members, Ladies and Gentlemen:—Since last we met another prosperous year has passed rapidly away and in common with others the farmer has experienced a share of the prosperity though perhaps not in a rightful degree. The merchant and manufacturer have profited by the rise in prices, the laborer by a rise in wages. The commodities furnished by the farmer sell on the markets for increased prices, but these prices are controlled so largely between the farmer and the consumer that the farmer does not get his just share. This state of affairs can only be changed by a closer organization and co-operation on the part of the farmers themselves and proper legislation in restraint of combinations which are stifling competition.

Indirectly this co-operation is one of the results aimed at by this association. What we need, in disposing of our seeds and other products, is a better understanding of the markets and the conditions which affect prices. No organization can long exist or be effective while in existence unless its members thoroughly understand each other and the object desired. This we hope will be one of the results of our association together here, that we may learn how to plan and work together for our common good.

In the general prosperity the farmer should have a juster share. The price of labor has gone up rapidly and it is a serious problem for the farmer to get his work properly done.

This problem is being rapidly solved to a great degree by the introduction of almost humanly endowed machinery. To crown all, from the dairyman's standpoint, has been the improvement and apparently successful use of the milking machine. Whether or not the general adoption of this machine will prove to be an unmixed blessing is yet a matter of doubt. Will not the adoption of these machines tend to centralize the dairy business in the hand of a few owners of large herds and thus do away with the competition which is the life of trade? But until such a condition of affairs obtains let us welcome any innovation which will tend to lighten the labor and make easier the life of the farmer.

It may seem that I am disgressing from the object of our endeavors, viz., to make Wisconsin the greatest seed grain producing state in the Union, but we must remember that Wisconsin is now and probably will always remain one of our greatest dairy states. So while we are raising seed to sell in all quarters of the globe, we can so rotate our crops as to produce feed for our dairy animals and give our fields a rest from constant seed production.

Certainly to keep our soils in good condition we can not dispense with the fertility which is returned to the soil by the dairy cow and the leguminous crops which are grown to form a part of her ration. Hence, everything which adds to the dairyman's prosperity will indirectly aid the seed grower.

So with labor lightened and eventually cheapened by the use of machinery and with good crops and fair prices for his products, the farmer has still much cause to be thankful.

To our members who have earnestly and intelligently taken up and executed the plans of the Association, this has been a year of unexampled prosperity. I venture to say that there are few growers of our select seeds, reporting to our office, who have failed to dispose of all available seeds at a good profit.

Those members are beginning to see the scope and value of our work, which is to aid and encourage our members in this select seed production until Wisconsin's fame as a good seed producer is not only national but international. From their own experiences they begin to see the possibilities in store for us when we have worked out our destiny and members of the Association are able to dispose of all seeds raised at such prices

as have been obtained by these few. We shall have reached the pinnacle of our ambition only when some seed dealer can write to our Secretary asking for a carload of select seed barley and have it furnished without delay. Indeed, we should be able eventually, to furnish select seeds of all kinds in carload lots.

Wisconsin is a great grass state and clover grows naturally everywhere. While on a trip into Rock county last August, the writer saw clover grown on a newly cleared farm among the stumps, which measured seven feet in length. We can and should produce an excellent grade of clover seed of all varieties, mammoth and medium red, alsike and white clover. Some of our members are already growing alfalfa seed. Let us look forward to the time when we can buy our alfalfa seed from growers in our own state. I believe the time is soon coming when this may be done.

We can also produce timothy, Kentucky blue grass and red top seed, all, I believe in paying quantities. So you see we are not yet begun on our labors and every member must buckle into the harness and pull. All pulling together we will soon accomplish our purpose and when we do, great will be the fame of old Wisconsin.

It may appear to some of you that I am eternally harping upon this subject of seed production, but I feel that there is need of it. "Oh ye of little faith! Why stand ye here idle all the day?" The field is ready to the harvest and yet stand ye idle. Comparatively few of our members have yet risen to their opportunities. One young man this season has, without difficulty, sold three hundred bushels of Silver King corn in the ear at three dollars per bushel. Others have sold all they had, and could have sold more. Practically every available bushel of Oderbrucker barley has been sold for many cents above the market price and the demand still continues. So I want you to realize and meet the opportunities offered you. Do not weary in the strife. "Ye shall reap if ye faint not."

We have one great competitor in the seed distributing business and that is the United States Government through the congressional seed distribution.

Seeds in small packets to the number of 40,000,000 are thus sent out annually and while not many of them may interfere with us or take the place of seed produced by us, some of them do. In any case the whole business is wrong in principle and should be condemned. This distribution of seeds, one third of which goes to city congressmen whose constituents cannot use

them, many more of which are thrown away as they fail to grow and occupy ground which otherwise might have produced a crop; all this costs the government an annual expenditure of $240,000, and the postal department $250,000 a year for transmission of the seeds through the mails.

If the seeds which are sent out were new or rare varieties it would not be so bad, but they are not. In the majority of cases they are old and well known varieties which could be obtained anywhere.

This amount of money could much better be used in importing new and strange varieties of plants or by the government and experiment stations in breeding up new and better varieties of our own grains and plants. This is a crying evil and should be abolished at once. I hope to have some action taken by this body in regard to the matter before our meeting adjourns.

Another subject which should demand our attention at this time and which probably as much as any other, affects our prosperity as seed growers, is that of good roads. It will be of little use for us to grow seed grains in selling which a large share of the profit is absorbed by the cost of transporting to the railway station or the market.

There are several reasons why good roads are important factors in the farmer's operations. When a crop is ready to market it should be possible for every farmer to haul heavy loads over a road with the least amount of wear and tear possible and in the shortest possible time. More important still the road should be in a condition to facilitate this rapid and easy transportation, winter as well as summer, spring as well as fall. This would allow a farmer to haul his products at any time, but especially in times of comparative leisure like the spring or winter when not much else could be done and when under present conditions our roads are in a reprehensible condition, to say the least. It would cost something to establish such roads, it is true, but they would pay for themselves in a few years in the reduction of transportation expenses alone to say nothing of the increased value of the farms located upon such roads.

When once properly constructed, such a road would be easily and cheaply maintained if left wholly to the supervision of one man thoroughly competent to attend to it. Such a man could be hired and all necessary materials purchased for much less than is now spent each year to keep our roads in a mediocre condition.

When we think of the time which could be saved, of the en-

hanced comfort of travel and freedom of intercourse and social enjoyment, besides the advantages already mentioned, it would seem that no price is too great to pay if thereby we might obtain them. The trouble is that few of us really realize the importance or value of good roads and think only of the taxes we must pay to maintain them. There is a great deal of agitation upon this subject at the present time, and a bill has been introduced at the present session of the legislature, which if it passes will make available $20,000 annually for two years for the purpose of "getting and disseminating information regarding the best methods and materials for road building."

Since this is so important a subject to us let us do all in our power to aid in the work among ourselves and with our neighbors. The time is coming when this will become a well established principle of farm economics. "Other things equal good roads lead to prosperity."

Then may we be pioneers in the work and may it be said of us in future years we so far forgot selves as to do the best, regardless of taxes and other burdens.

More and more do your officers realize the mighty force this association is destined to exert in the social and economical life of this state. We see it much better than do you perhaps, as we are in touch with every member of the association while you reach but a few and are on the edge only of the mighty wheel and hardly feel its power.

I wish to express to you my gratitude that you have given me the opportunity to, in slight degree at least, aid in directing the volition and energy of this association.

The labors connected with the work have been and are arduous, but the compensations also are great and it has given me great pleasure for three years to have served the Association. I look for great things in the future if each member of the Association does his part.

SECRETARY'S REPORT FOR 1906.

R. A. MOORE, MADISON.

Another year has rolled around since our last meeting and many changes have taken place in that short lapse of time. Our society is now past the experimental stage and its members are self reliant, and eager to accomplish that which our association expects to do, namely, to make Wisconsin the greatest seed producing state of America.

Through earnestness and honesty of purpose our membership have placed within reach of Wisconsin farmers and those of other states, varieties of seed grains that far surpass in quality and yield any heretofore grown within our state. The dissemination of these choice seed grains throughout the state has added many million dollars to the total value of our farm crops and we have as yet just begun the good work. Our little society has risen from a few faithful members to something over nine hundred and the membership is still on the increase. We trust this association which was founded for a great work will so far fulfill its mission that members will be known in every village, city and township in the state, spreading their work of the dissemination of good seeds and giving wholesome advice as to the growing of grains and forage plants.

When we realize that the leading farm crops of Wisconsin are valued at one hundred million dollars and that it is possible to add from ten to fifty per cent to this great crop by the introduction of pedigreed varieties of grains and forage plants, we can then form some conception of the great work we have in hand.

Our state has been loyal to our society and in the hours of our weakness came to our rescue with funds to aid us in carrying out the work we had inaugurated. It seems that with our great membership, some of whom are living in every county of the state, spreading their influence throughout all agricultural districts, that our state can afford to again come forward and give us further aid in carrying on this important work. The National Government is intensely interested in our grain work and has taken steps to assist our association and Agricultural College in making Wisconsin the great seed barley state of America. I feel that our state will willingly assist as fast as we can show them results.

Experiments Carried on During the Past Year.

SILVER KING CORN (WISCONSIN NO. 7)

Members of the Association who had not heretofore experimented with this variety of corn carried on tests the past season and from the data received we are able to report as follows:

Number members reporting 72
Number counties in state 71
Number of counties from which reports were received 35
Average percent germination of the seed 96.3
Number reporting corn as well matured 62
Number reporting failure to mature 10
Maximum yield (bushels shelled corn per acre) 122
Minimum yield (bushels of shelled corn per acre) 25
Average yield per acre (bushels of shelled corn) 67.2
Average yield per acre any other variety 54.8
Difference in yield in favor of No. 7 corn 12.4
Average yield per acre on fall plowed land 58.9
Average yield per acre on spring plowed land 54.8
Number of parties planting on fall plowed land 17
Number of parties planting on spring plowed land 45

The No. 7 corn was first grown by the association in 1903, and seed disseminated in all localities where grown. For three succeeding years the corn has given exceptionally good yields and has become the popular corn against all other varieties in many localities.

Through the kindness of the Experiment Station, we will again control several hundred bushels of this good seed corn, which is fire dried and ready to go into the hands of members of the Experiment Association strictly for experimental purposes.

Members who have not heretofore secured the No. 7 corn will be furnished sufficient seed to plant one acre the coming season. Do not leave Madison without securing the seed corn.

A limited number of members tested the Early Yellow Dent (Wis. No. 8), and from data received we are able to tabulate the following:—

EARLY YELLOW DENT (WISCONSIN NO. 8.)

Number members reporting	30
Number counties in the state	71
Number of counties from which reports were received	29
Average per cent of germination of the seed	97
Number reporting corn maturing well	25
Number reporting failure to mature	5
Per cent of corn failing to mature north of Marathon Co.	33⅓
Per cent of corn failing to mature south of Marathon Co.	16⅓
Maximum yield per acre (bushels shelled corn)	110
Minimum yield per acre (bushels shelled corn)	23
Average yield per acre (bushels shelled corn)	55.7
Average yield per acre any other variety	61.2
Average yield per acre fall plowed land	50.7
Average yield per acre spring plowed land	61.5
Average yield per acre planted in checkrow	54.7
Average yield per acre planted in hills by hand	62.5

We desire members living in northern counties to again make tests and will furnish seed for such experiments.

ALFALFA.

The work in getting alfalfa established in Wisconsin has covered a period of many years. Ex-Gov. Hoard has carried on tests with alfalfa through a series of years in Jefferson County, that have been of immense value in demonstrating the importance and possibilities of this great plant.

Through the Wisconsin Experiment Association with its large membership scattered widely over the state, the Station has been able to carry on cooperative tests with alfalfa under many varying conditions as to soil and climate. In the newer sections of the state, alfalfa is yet in the experimental stage, and farmers should refrain from sowing large areas to alfalfa until they are quite certain that their land is suitable for the crop. The seed is expensive and the crop is uncertain where conditions are unfavorable.

One or two acres should be grown for a few years as a test crop before sowing the farm extensively to alfalfa.

The alfalfa area is being widened rapidly and several thousand farmers are now growing the crop successfully.

At the request of the Experiment Association, members living in different counties of the state started new fields of alfalfa, the association furnishing uniform seed of high vitality for such tests.

The following data has been tabulated from the reports received from members sowing alfalfa the spring of 1906.

REPORT ON ALFALFA, FIRST YEAR'S SEEDING.

Number members reporting	74
Number of counties from which reports were received	40
Number advocating sowing with nurse crop	35
Number advocating sowing without nurse crop	5
Number not reporting on nurse crop	34
Number getting good stand	60
Number getting poor stand	7
Number reporting a large number of nodules where ground was inoculated	14
Number reporting no difference	15
Number reporting a notable difference in the appearance of alfalfa on inoculated and uninoculated plots	19
Number reporting no difference	15
Number not inoculating	22
Number finding nodules without soil inoculation	7

WINTER KILLING OF CLOVER AND ALFALFA.

The winter of 1906 was severe on clover and alfalfa especially in the southern half of the state. To determine the extent of damage done and the cause thereof, with other data of interest, letters of inquiry were sent to members of the Experiment Association. In order to get information from as wide an area as possible, these letters were sent to members living in as many different counties as possible. From the data received we are able to report the following as the testimony of the members interrogated.

SUMMARY OF REPORTS ON RED CLOVER.

Number of members reporting 201
Number of counties from which reports were received 52
Number sowing clover as a mixture with grasses 152
Number sowing clover alone 49
Number of fields examined 354
Average number of living plants in each field on four square feet of surface 56
Average number of dead plants on four square feet of surface 18
Approximate number of acres in all fields inspected 6192
Number reporting clover as winter killing badly 107
Number sowing with a nurse crop 198
Number sowing without a nurse crop 3
Maximum amount of clover seed sown per acre in pounds .. 23
Minimum amount of seed sown per acre in pounds 4
Average amount of clover seed sown per acre in pounds.... 10
Number pasturing clover first year 127
Number growing clover for seed 75
Average yield of seed per acre in bushels 4

Causes for winter killing:—Ice on the ground through portion of winter. Sudden freezing and thawing in the spring. Not enough snow. Pasturing too closely in the fall.

SUMMARY OF REPORTS ON ALFALFA.

Number of members reporting 118
Number of counties from which reports were received 39
Number sowing American alfalfa 66
Number sowing some other variety 52
Average number of living plants on four square feet 52
Average number of dead plants on four square feet 37
Number of fields entirely winter killed 14
Number of members sowing alfalfa with a nurse crop 85
Number using barley as a nurse crop 63
Average amount of seed sown per acre ..... 20 lbs.
Number sowing without a nurse crop 33
Total number of fields examined 201
Total number of acres of alfalfa inspected 365
Number reporting alfalfa as badly winter killed 54
Number who pastured alfalfa 7
Number growing alfalfa for seed ..... none.

Causes for winter killing:— Sowing late in season; pasturing; cutting too late in season; nurse crop lodging; ice freezing over the ground; water standing on the field; freezing and thawing in the spring.

From the information secured from members of the Experiment Association, combined with observations made at the Station and on farms in the vicinity of Madison, we conclude as follows:—

Clover and alfalfa were badly winter killed in the southern half of Wisconsin during the winter of 1906. In northern Wisconsin the crop was protected with snow and suffered little. Alfalfa proved to be as hardy as medium red clover where it was grown under like conditions. The chief cause advanced by the majority of experimenters for the winter killing of clover and alfalfa was the frequent thawing and freezing in the early spring. Where alfalfa was grown on low, flat land it suffered much from the effects of the snow melting during warm days and filling depressions of the land with water, which froze during the night and smothered the alfalfa.

It was thought that alfalfa suffered from late fall cutting and by pasturing to considerable extent.

Seed is not as yet generally grown from alfalfa. It will be necessary for the alfalfa plant to become thoroughly acclimated before seed can be secured in paying quantities.

Clover is grown for seed extensively in Wisconsin, and an average of four bushels of seed per acre was secured by the members reporting.

TESTS WITH ODERBRUCKER BARLEY (WISCONSIN NO. 55).

Two hundred and fifty members carried on tests with this select variety of barley during the past year. The information given herewith will be of interest to our Association.

REPORT ON ODERBRUCKER BARLEY, 1906.

Number parties reporting to date	127
Number of counties from which reports have been received	45
Number sowing on fall plowed land	90
Number sowing on spring plowed land	37
Number sowing with drill	54

Number sowing with broadcast seeder	70
Number sowing by hand	3
Number of cases in which barley remained erect	91
Number of cases in which barley lodged	21
Number of cases in which barley rusted badly	2
Number of cases in which barley rusted slightly	28
Number of cases in which barley did not rust	97
Number of cases in which smut developed	22
Number of cases in which no smut developed	40
Number of cases in which smut developed slightly	65
Average yield per acre of Oderbucker barley, in bushels	39.1
Average yield per acre of best other variety, in bushels	33.6
Yield per acre of Oderbucker barley over other varieties on trial	5.5
Average yield of Oderbucker barley on fall plowed land	39.9
Average yield of Oderbrucker barley on spring plowed land	37.5
Yield per acre in bushels on fall plowed land above same on spring plowed land	2 4
Average yield in bushels where sown with drill	28.4
Average yield in bushels where sown with seeder	39.9
Average yield in bushels where drill was used on fall plowing	39.41
Average yield in bushels where drill was used on spring plowing	36.2
Average yield in bushels where seeder was used on fall plowing	40.3
Average yield in bushels where seeder was used on spring plowing	39.1
Average yield in bushels where grain was sown by hand	33.3

Sufficient of this choice seed barley to sow one acre will be given to those members for experimental purposes who were unable to secure it last year. The barley will be given in the order of the applications received.

The progress we have made in agricultural advancement has attracted attention in the most remote parts of the state, and numerous complimentary letters from farmers and people interested in better agriculture show plainly the appreciation held

by others of the work started. The careful manner in which our membership has grown pure-bred seed grains has been the means of putting this line of effort on a firm foundation, and farmers and seedmen now look forward to purchasing these carefully grown grains. No one factor in my estimation can help the Wisconsin farmer more at the present time, than the fact that within easy reach he is able to secure high yielding grains and forage plants, that have become properly acclimated for his respective locality.

It means the rapid dissemination of choice bred seed grains, which have taken years to produce by careful breeding.

One of the functions of the Experiment Association is that of a distributor of up to date agricultural thought and methods. With our membership so widely distributed, we are able to present practical examples by every roadside of what can be done by any farmer who seizes the opportunity afforded him.

The chief effort of the Experiment Association during the past year has been to improve the corn crop and determine the value of alfalfa as a forage plant.

Alfalfa.—Three hundred forty-five members were given alfalfa seed, sufficient to sow at least one-half acre in accordance with outlines furnished them. One hundred and sixty were furnished with soil for inoculation purposes taken from an alfalfa field where the plants had developed bacteria-laden nodules. The general success or failure of these experiments will not be fully determined until another year.

The following data will give a general idea of the progress made this season in growing alfalfa.

REPORTS ON ALFALFA, FIRST YEAR'S SEEDING.

Number members reporting	185
Number of counties from which reports were received	48
Number advocating sowing with nurse crop	86
Number advocating sowing without a nurse crop	40
Number not reporting on nurse crop	59
Number getting good stand	130
Number getting poor stand	44
Number of absolute failures	0
Number reporting larger number of nodules where ground was inoculated	21
Number reporting no difference	12

Number reporting notable difference in the appearance of alfalfa on inoculated and uninoculated plots	34
Number reporting no difference	53
Number not inoculating	98

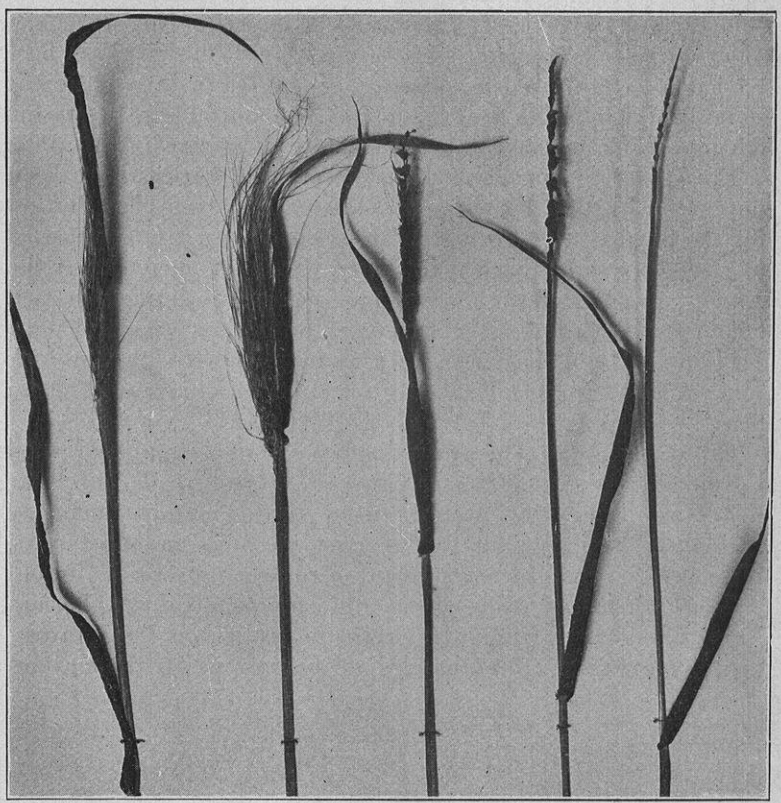
REPORT ON ALFALFA ONE YEAR AFTER SEEDING.

Number members reporting	70
Number counties from which reports were received	36
Number counties in the state	71
Number securing crop year of sowing	4
Average per cent of winter killing	11.8
Average number cuttings obtained the second year	2.2
Average number tons of hay obtained per acre	3.72
Number having no difficulty curing the hay	36
Number using hay caps	5
Number reporting abundance of nodules on roots of plants	35
Number reporting no nodules on roots of plants	13
Number failing to report as to nodules	22

We do not propose to stop here but will push the work vigorously until this great forage plant can be grown as generally as we now grow red clover. We have met with some failures but this should make us more eager to succeed, and I look forward to a great victory. I think one of the chief difficulties we have had to contend with in growing alfalfa, barring poor seed, has been the lack of the proper germs in the soil. The much abused sweet clover (Melilotus alba) has been working diligently to supply the soil with the germs which act in a beneficial way on the alfalfa plant, and thus pave the way to successful alfalfa culture. I feel we should aid this plant in its most useful mission.

Where the soil has not been supplied with the proper alfalfa germs through sweet clover, as the distributing agent, or by the scattering of soil from old alfalfa fields, only a small portion of the alfalfa plants will develop the nodules and the remainder of the plants languish and die, thus making the catch too thin. However, the plants that live, develop nodules and will amply supply the soil with the germs for future crops of alfalfa. In every case where a failure to secure a good stand of alfalfa is due to lack of the proper germs, we should plow, prepare the soil and reseed the same plot of ground to alfalfa. If farmers in

general would secure a few pounds of alfalfa seed and mix with clover or grass seed which each year is sown quite generally throughout the state, the few plants that would develop nodules would distribute the proper germs to such an extent that when the grass land was broken up for corn or other crops the season following, the ground would be amply supplied with the germs to insure a good growth of alfalfa. If the above plan was followed for a few years, I feel confident that alfalfa could be grown successfully on nearly all farms.



DIFFERENT STAGES OF THE LOOSE SMUT OF BARLEY FROM EARLY APPEARNCE UNTIL BLOWN FROM THE STEM.

Two hundred members of the Experiment Association are carrying on tests in accordance with outlines furnished for the extermination of this grain disease.

Swedish Select Oats. (Wisconsin No. 4).—The Swedish oats are now grown so generally that they are past the experimental stage, and are merely grown by members of the association as select seed oats. All members of the association desiring to be placed in the Seed Growers' list, who were not listed in the fourth annual report, are requested to report to the Secretary at their earliest convenience. The names of all members having select seed grains for sale should appear in the next annual report.

Barley.—For six years tests have been carried on at the Experiment Station with select varieties of barley to determine the best feeding and malting barley for Wisconsin growers. One variety known as Oderbucker (Wisconsin No. 55), has shown superior characteristics throughout the test. This barley has been improved by selection and tested in three different counties. From the tests made we feel quite safe in stating that we think we have the best variety of barley in the state.

Five hundred bushels of this select seed barley have been purchased by the Experiment Association from the Station for the purpose of carrying on an extensive test. Our desire is to place this seed barley into the hands of members of the Experiment Association, giving one sack of two bushels to each member who will agree to carry on the test in a careful manner. The barley has nearly all been subscribed for, and we look forward with a great deal of interest to the outcome of these tests.

Grain Exhibit.—The grain display of last year proved to be a decided success, and the number of entries made this year shows the increased interest taken in the improvement of grains and forage plants. We must not rest contented until Wisconsin is the foremost seed grain raising state in the union.

The high priced lands of our state practically force the majority of our members, who desire to realize on their investments, to grow something besides ordinary crops for the market.

In Memoriam.

Fred Rietbrock and Peter A. Dukleth.

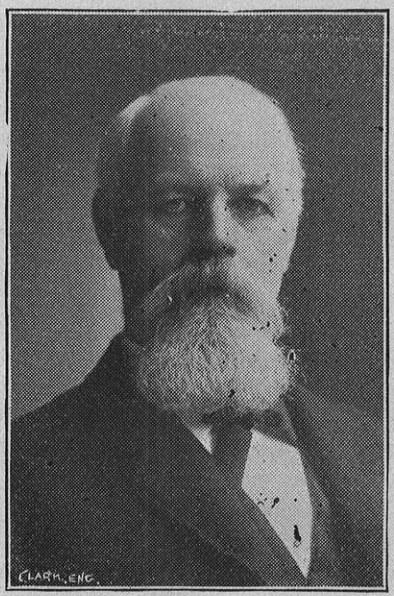
FRED RIETBROCK.

A. J. PHILIPS, HONORARY MEMBER OF WISCONSIN EXPERIMENT ASSOCIATION, WEST SALEM, LA CROSSE CO.

Mr. President and Members of the Wisconsin Experiment Association:—

GENTLEMEN:—In responding to your invitation to address you at this time on the life-work of your fellow member and co-worker Mr. Fred Rietbrock, I feel it an honor to be selected for the task and at the same time feel my inability to do the subject justice. It was my good fortune to spend the two weeks previous to his last trip to the west with him at the Dairy show in Chicago and at his home in Athens. It is a rare treat to know and associate with such men. It is a rare treat to your society to have such a man enroll himself as a member of your society and assist by his means and good advice to further its interests. He was a true practical philanthropist and a benefactor in the fullest sense of the word and the grand results of his beneficient work for the betterment of his fellowmen will be a living monument to his memory as long as the state of Wisconsin and Marathon county shall exist. There have been many persons who have been lauded for their great generosity whose only effort was to order a check filled out to found some charitable institution, endow a college, or build a costly library where people so inclined can while away their leisure hours reading anything their fancy craves. Fred Rietbrock was a greater philanthropist and benefactor and more munificent than any of them, because he gave not only as great a per cent of his wealth as they did for the benefit of mankind, but he also gave of himself without reserve, of the work of his brain, of his heartfelt sympathy, kindly advice and encourage-

ment to uplift his fellowmen. He did not give for his own aggrandizement or to be lauded as a great benefactor or try to perpetuate his memory by costly monuments, but he gave in a quiet, unostentatious way for the betterment of mankind. It has been truly said that the greatest benefactor is he who makes two blades of grass grow where only one grew before.



FRED RIETBROCK.

Mr Rietbrock did this and more in its broadest sense. He surely made the northern wilderness bloom like the rose and turned a barren waste into well tilled, productive farms, with comfortable homes, occupied by happy, industrious, and progressive farmers and their families. Not only did he help organize good schools for the education of the children, but he employed and paid competent instructors to teach farmers the improved methods of farming and dairying. It was through Mr. Rietbrock's thoughtful generosity and foresight that many learned to double the yield of their acres and the product of their cows, as well as to double their value by proper breeding. It was through his unselfish generosity that his county, Marathon, was enabled last fall in 1906 to offer a liberal premium for grade females of the Guernsey breed, which act encour-

aged the farmers so that the show of those cattle was second to none in the state. Mr. Rietbrock needs no great structures of brick or marble as memorials to his grand and noble character and benevolent deeds, for he has a more fitting monument in the love and veneration of those whose lives he has brightened, broadened and refined, to whom his loss is irreparable and whose children will rise from generation to generation and bless and revere his name. This spirit was beautifully exemplified at his funeral at Athens when the citizens, old and young, turned out en masse and strewed the road from his home at his son-in-law's to the depot with evergreens and flowers. His loss will be felt not only in his own county but in your meetings and in other meetings of which he was a member, and also among the Guernsey cattle breeders of the state and nation among whom he had by his intelligent work taken a prominent position. But he has gone, and as a society we will revere his memory.

Gentlemen, I thank you for your attention.

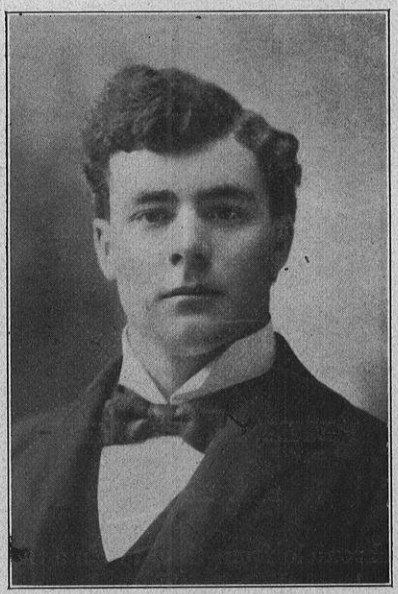
PETER A. DUKLETH

R. A. MOORE.

We regret to chronicle from time to time the death of faithful members who have their earthly career cut short by accident or sickness. It is especially sad when members are taken from us in the full vigor of manhood, when there seems so much to live for. This sentiment applies particularly to our departed friend and worthy member, P. A. Dukleth.

Mr. Peter A. Dukleth was born in the town of Norway, Recine County, December 2, 1872, and brought to Waukesha County the following year where he has since lived with his parents on a farm near Silver Lake. Largely through his efforts and foresight the farm was made one of the noted stock and grain farms of Waukesha County. His natural taste for farming led him to pursue the studies of the Short Course in Agriculture at the University, completing in 1898. The thoroughness of his work and the aptness shown in all his studies won for him the respect of all his classmates and

instructors. Through the recommendation of Dean Henry, Mr. Dukleth was appointed by the Regents, instructor for the winter term in Farm Dairying, which position he held for several years with credit, until obliged to give up on account of failing health. No instructor in the College of Agriculture was held in higher esteem than our Mr. Dukleth, who was ever ready to assist in the hour of need. He will long be remembered as the students' friend and the knowledge he imparted will continue to perform its mission for many years to come.



PETER A. DUKLETH.

Mr. Dukleth was active in agricultural organizations of the state as his many papers and addresses found in the various reports will show. In 1904 he was elected treasurer of the Agricultural Experiment Association and re-elected again in 1905 and 1906. No member manifested a deeper interest in our growing organization and his works and letters of encouragement has had much to do with its success.

The writer had learned to love him as a brother and with his parents and friends feels his loss keenly. Our Association has lost a true and valiant member.

ELEMENTS OF SUCCESS ON THE FARM.

W. L. AMES, OREGON, DANE COUNTY.

Young Men of the Agricultural Experiment Association: Asked by your Secretary, Prof. Moore, to assist on your programme by presenting the subject of "Elements of Success on the Farm", my first thought was to say "No" to his request. But later perceiving that he had not prefaced the subject with the definite article "the," I said to myself, "I can surely discuss some of the "Elements of Success on the Farm". Else my life of nearly fifty years, and all spent on the farm, has been more badly wasted than I am willing to admit. And yet, realizing my insignificance in the great field of farm operations and investigations, I approach the subject assigned me with the diffidence that the music teacher, the doctor and the lawyer would, each, his labors, with his art only in a small degree acquired.

I come to you with no patent and few heretofore unheard of ideas. My entire outline will be more of a reminder to you than anything else. My entire effort here may reveal to you the pleasure I experience in picking up and gleaning the little objective ideas that lie thickly along the path of every person, if he has but the power to see them and perceive their value, and to give them the thought that they are entitled to.

SUCCESS IN CITIZENSHIP AS WELL.

Again, I cannot discuss the topic assigned without broadening it to include success in citizenship as well as on the farm, for a life-time's observation reveals to me the fact that no man can be a successful farmer and not be a good and useful citizen. He may be a good citizen and not be a successful farmer, but not be a successful farmer if he is not also a good citizen. And what do I mean by a good citizen? The man who spends his whole life laboring only for himself? Never. The good that men do to others only, lives after them. No man can be more quickly forgotten after his death than the man who has spent his whole life laboring diligently for his own personal ends and preferment, and entirely neglecting opportunities for doing something for others moving also in the same

current that he is, but perhaps at a slower and more laborious pace than his own.

PUBLIC AS WELL AS PRIVATE SIDE TO AGRICULTURE.

There is a public side and there is a private side to farm life. There is little danger but that the diligent and active minded man and farmer will give good and due attention to the private or individual side of farming, but will he also recognize the just demands of the public side and give to that phase of farm life its just share of his attentions, that will assist in securing to his chosen occupation its just share of public utilities, attentions and advantages that it is entitled to and that unless its subjects co-operatively demand and labor for they need not expect any one else to champion.

OPPORTUNITIES.

Again I suggest that much of your future success and usefulness will depend on your ability to discern and take advantage of opportunities. I heartily commend your labors here and believe you are here taking advantage of one of the very best of opportunities, not only of serving yourselves, but at the same time advantageously serving your fellowmen. Ever keep your ears open for the expression from others that is so often heard in discussing matters in which a public is generally interested, "Why don't someone do something about this matter to remedy it." Remember, the question is never aimed back at themselves, but always is "Why don't someone else do the something." If a remedy is possible, here is your opportunity and if the remedy is undertaken with careful thought and study you may surprise yourself with what you may accomplish.

MAKING KNOWN LEGISLATIVE NEEDS.

We are again in the early part of another Legislative session. Are you making known to your representatives your various legislative needs? If not, do not censure them for not appropriately serving you. Two years ago we asked and received your support to the matter and propriety of abolishing the camping of gypsies and others on our public highways. The matter was placed before the legislature in the form of an amendment to previous legislation. After attending it through

both Assembly and Senate committees, and all the time receiving the assistance and hearty co-operation of our worthy representative, Hon. John S. Donald, and finally sending a plea to the Governor for his sanction, which it finally received, it emerged in the favor of the property owners and the public instead of, as in the past, in the favor of the gypsies.

SUCCESS A GROWTH.

Again, young men, success is not likely to come to you at a single bound. It is much more likely to be the result and growth from small incidents, and those small incidents right in or very near your own homes.

WISCONSIN HOMES.

Young men, let me remind you that you live in a part of our country maintaining the very best of farm homes. They are surpassed by no state that I have ever been in. Not only best farm homes, but best schools, best citizenship, best evident degree of prosperity. Best evidence of Christianity. Best bread makers. Ah! little do our mothers, sisters, and wives know how much they are contributing to our chances of success in our labors, whatever those labors are, by preparing for us good bread. It is an art that cannot be too highly extolled, and one worth looking after a thousand times, over the art of painting, drawing, music, or fancy work in the party we call "our best girl".

I refer with pride to our magnificent schools, maintained by tax, for the purpose of cultivating the intellect, best of God's gifts to man. But I blush with shame when I contemplate that that same great government, for dollars, whether they be few or millions, will license other institutions to make fools and driveling idiots of men.

Let me go with you to your various homes and note a few little inconspicuous things which, however, bear the ear marks of a good home. As I drive in perhaps alone, and a little strange to the place, will I find one or more good hitching posts in plain sight and in appropriate places for the calling stranger or guest, or will my only alternative be the much gnawed corner of the old corn house? Boys, did you ever realize that hitching posts indicate civilization? That they plainly say to the neighbor or stranger guest, "Come in, come in. We want

to see you and talk and visit with you. We are social beings and desire to mingle with our good fellowmen." And that the absence of them says just the opposite: "We don't want you to come in. Go your way and let us go ours. We are isolates and desire to live alone." Such is unerringly the language of the home "hitching post." But before leaving this point, let us just drop a tear of sincere pity for the "isolate," the man who really desires to live alone. Also one more thought right here. All successful men have their busy days, and if we are the calling party and are on an errand, we should discern quickly, if perchance this is one of our host's busy days and, if so, it is creditable in us to make our errand known promptly and directly and not after a long drawn out discussion of the weather and other indefinite subjects over which we have no control discuss them as we will. An important element of success in any line of business is to be able to compass much business in short time, if necessary. It is the man who can do this well and independently that the business world is looking for today. So important is this matter of the "Good Home" in the development of success and good citizenship, in my opinion, that I am not yet ready to leave it.

I am thirsty for a drink of good Wisconsin water. Will I surely and at all times find a "cup at the well," with which to secure that good drink? Is that place that you call "home" a place of peace, and happiness, and mutual co-operation, and where the little things done for one another is a perpetual joy? Or is it a place where bickerings, oaths, vile language, and tobacco juice and smoke prevail? The latter, "elements of success's"? No. If the author of this address may lay claim, in any degree, to the elements under discussion here, that possession may be attributed, more than to any other one thing, to the environments of one of *Wisconsin's happiest homes.*

PERSONAL HABITS.

Closely after direct home influences on "Elements of Success" I would discuss briefly "personal habits." First among these; I do not dispute any man's privilege, be he young or old, to acquire the habit of smoking or chewing tobacco, so long as his habit does not interfere with any one's pleasure, but when, in inclosed quarters, he does insist on saturating others with his stale fumes, I protest, and claim that if the

odor was an especial favorite with me personally, I would have an equal right to saturate him and others with the triple extract of skunk, no matter how obnoxious it might be to him. More than once on my return home from purely business expeditions, has my good wife prompted me to disrobe at once and hang my garments out doors till that *horrid stale tobacco smoke* was aired out of them. And does your home show spit marks of tobacco juice? Filthy habit, boys. For your own sake, for the sake of your good wife, or the girl whom you expect some day (and I hope it will be soon) to become your wife, abandon it.

Boys, I consider the young man and farmer attired in clean overalls, dressed fit to meet a king. Remember, I said clean overalls. That is, with dirt not much over a week old on them. To meet the farmer anywhere and everywhere with his overalls bearing the dirt and stale milk marks of a month, or perhaps months previous, is disgusting, and yet we evidently often meet such. A hastily prepared apron from an old grain sack and left at the barn to slip on at milking time, will effect a great improvement in the daily appearance of the overalls and then don't fail to put the apron through the suds often A tidy dress and good, prompt business appearance away from home when called thus on business. Men of wide business experience and observation learn to read the man quickly, of lesser experience, and pretty accurately size him up. I have had from time to time, considerable dealings with R. R's. perhaps generally started by correspondence and ere long I would be suddenly requested to meet a representative at the station for a brief interview, and it would oftentimes be *so brief,* that I simply concluded that they called me there mostly to see what I looked like and to size me up. Whether so or not, I have generally accomplished with them what I sought to.

Cultivate *progressive* ideas and thought Study subjects just a little in advance of the average student. Be not satisfied with less than the ability to impart to *someone, some* information that they did not possess before. The best part of a letter is often the interlinings and marginal notes. So often, *true character* is read in our smaller and most insignificant acts. The reading of character, by ones acts, is one of the most fascinating of studies and is oftimes very useful. After the extreme sacrifices of many of your parents in affording you a schooling, stand up young man or young woman, that we may see what you look like. You that would indulge in a frolicsome and sight seeing vacation, before those same

sacrificing parents have had an opportunity to see what the outside boundaries of their own county looks like.

In your business methods let truthful statements sustain you, and then cultivate a directness of statement that shall carry conviction with it. Alone, I once met a local committee of 12 men, to arrange with them for a gathering of the 'Farmers National Congress" in their city. After some preliminary routining their chairman said to me, "Mr. Ames, what is your business?" "What is my business," said I, "why sir, "I am a farmer," I responded. "Ah yes," he said, "theoretically, but what is your *real* work or business?" "Why," said I, "I am a farmer." "You do not quite understand me," he said. "You are perhaps a newspaper or desk farmer, or —" "Oh no, no." I said. "I am a *real* farmer, in proof of which I show you my hands, callosed and labor marked." That convinced him, and he added, "It is the *real* farmer that we hope to entertain in your session here," and from that time on our meeting was most congenial and resulted in one of the best and most successful gatherings that we had ever experienced.

MUCH EXPECTED OF MAN.

That man was given control over the animal kingdom is not a mere say so, for witness every day observation. By kindness, resolution and training the massive bull submits to him. The spirited stallion obeys him, the mischievious colt, becomes his most faithful servant. The cow by patient persuasion gives up her baby offspring that she may the better serve man's needs. The nervous and shying calf finally submits to familarity through the influence of the comb and brush, even though they be administered at first at the end of a yard stick or handle. The dog by nature, a mere frolicsome plaything, but remarkable of all, the honey bee, accepts the home we provide for him and most wonderfully works on the lines we lay out for him. By means of the so-called "starters," little strips of artifically prepared honey comb, slightly but *regularly* stuck in the sections of the hive and supers, the vicious little insect follows directions and specifications, and produces for man, one of the most perfect pieces of workmanship that was ever constructed, its greatest value lying in the perfection with which the insect worked under man's ingenuity and direction.

NEIGHBORHOODS.

Men live in neighborhoods. Neighborhoods and localities are progressive only as they work together. In matters of public interest, pull with your neighbor, and in all things pull on the tug and not on the hold back. My nearest permanent neighbor should be my best neighbor. Beware of the man who considers his neighborhood the worst one he ever lived in. It will not require a magnifying glass to reveal the probability that the most uncongenial and perhaps the most eccentric character in the neighborhood occupies his home. It, at least, is a bad indication. Pity this man, and also the man who takes his team and goes afield to put in his Sundays at field work. Nothing is gained thereby. With Saturday night plan a close up of regular business, necessary chores excepted.

OBSTACLES.

Will continue to appear as long as human existence continues, but don't hunt them. Nothing wearies me more than, when a project is suggested, that, in the main looks feasible, to have some pessimist, someone who is always pulling on the hold back, begin to suggest the obstacles in the way of the project. If it is a good thing, *away* with your obstacles, get on the other side of those obstacles, over them, under them, to the right or the left of them, *brush them aside;* get on the other side of them and *go on* with the good project. Cultivate *courage and confidence in your ability to overcome obstacles.*

DO THINGS YOURSELF.

And don't wait for some one else to start. It has been said that the world is made up of two classes. "Those who lift and those who lean." For your own sake and the sake of humanity be of the *doing* and *lifting* class. By reason of a collision between a fast moving passenger train and a carriage recently on a railroad crossing that would easily admit improving, two precious lives, occupants of the carriage, were instantly sacrificed. At the close of the funeral services there came the expected expression from a hundred lips, "Why don't some one do something about that crossing?" But one person in the hundreds had thought to do something. That person had prepared a petition to the R. R. for a subway at that point. It was at once

exposed and complimented and received the signature of every man present. This same person, alone continued to push the project. The petition went to the R. R. company and with such apparent sincerity and earnestness, backed by consistency and justice that it received, at their hands, gracious and immediate attention with the result that a subway at that crossing for the highway traffic is promised with the opening of the coming spring.

A PROGRESSIVE CITIZEN.

Do the highways need opening after a snow blockade in the winter? If so, don't let your first great effort be *to get the commissioner there* but get out *yourself* and surely open along your own premises at any rate. The commissioner can't do it all. Every progressive citizen has a duty to perform. Are you a progressive citizen?

REQUISITES.

As I have said before., Do business errands quickly and to the point. Keep engagements. Become known as "reliable," and that your word is as good as your signature. If an engagement *must,* because of unforseen circumstances, be deferred, make all haste that a reason and excuse reach the other party before the engagement time expires. Few things lower a man more in the writer's opinion than to apparently, deliberately fail to keep a *business* engagement. He desires to at once cancel that man's name from his business calendar. Don't ask people to guess who you are over the telephone. You don't know what conditions exist at the other end of the line. In fact it is not a good habit to tax people at any time to *guess* who you are. There is nothing gained to you and it is embarrassing to the other party. Should you care for my friendship as I desire yours, I should be pleased to shake hands with every one of you, and in future wherever we may chance to meet, just please pinch my arm and mention your name and where we met. I shall ever be thus pleased to meet you.

PURE BRED LIVE STOCK.

Ally yourself with some line or lines of pure bred live stock. Of course you will not think of farming without including the handling and raising of live stock and you certainly should as-

pire to handle and produce something that would be *especially attractive to some one,* and I do not believe you will do it with a yard full of mongrel stock. At any rate, not nearly to as good an advantage as you would with *some* pure bred representatives. What constitutes the great attractions at our most noted fairs and live stock shows? Mongrels? Never. It is the animals that have been bred to certain types for generations back. And what of the man today, who jumps frog fashion, this way one year, and that way another year in his breeding operations, until at the end of the third or fourth year, he is ready to go back to some breeder of pure breds to get a start again. *Very attractive mongrels are scarce.*

Few things that we have to do are more obnoxious than having to wash for *the hired man who never bathes.*

TYPEWRITERS.

Few things will add better finish to your business correspondence than the use of the typewriter. It is a machine, that by degrees, any one can learn to make practical use of, and while perhaps not many of us have $100 to invest in such an article, yet, I believe I am safe in saying that there are machines on the market for a long ways less than $100 that are capable of doing satisfactory work, and that bear a reliable guarantee. I am making every day practice use of a typewriter at home that cost me $20 and I do not see why it is not answering my every purpose. I will be glad to discuss the matter further with any who are thinking of buying and using a typewriter. I predict that within the lives of many of you here, many of the carelessly pen written business letters will find their way to the waste basket *unread.* I have had a wide experience for a farmer, in the last three months in trying to decipher hand writings and as a result I am thoroughly tired of "guessing." Until you do acquire the use of the typewriter (which latter I would heartily encourage in all) let your great effort be to acquire and practice a plain and legible handwriting.

LETTER HEADS, BUSINESS CARDS AND ADDRESSES.

Cultivate a home business that is worthy and then do it the honor to have some letter heads printed mildly advertising that home and business. A business card handed to a stranger is your very best introduction, even though it bears nothing but your name and address. In giving your address if it be

a small and inconspicuous village, also give your distance and direction from your nearest *large town.* I have often ceased to look for the address of some advertiser because of this latter lack of information.

WORK TO ACCOMPLISH.

To me it is exceedingly tiresome to hear a person talk long in advance of a certain ordinary piece of work. To see them approach it from one side, and then back off; flutter at it from another side and again recede. *It is very gratifying* to see a good executor of work *attack an undertaking* and *go through with it.* Great is the compliment to a laborer to have it said of him, "He makes no false motions." Then cultivate the habit of "working to accomplish."

THE INDEPENDENT LABORER.

The world's service today calls for the man who does not necessarily have to have company in his labors. The man who can take up a piece of work independently and proceed with it reliably, to completion. The man who is afraid he will give his employer more than his wages worth is not a likely candidate for an advance in wages. How some *dependent* people live on the small amount of work that they seem to accomplish is yet a conundrum to me.

OARSMEN NEEDED.

A man (a preacher I regret to say) once invited himself to go fishing with me. We approached my boat, and as I unfastened it he got into the boat and took a seat. *What* seat do you suppose? The oar seat? *Never.* He plumped himself into the lazy back in the stern of the boat and announced his readiness now, for a grand good time, (at his host's expense). If that man's work in his parish were also of this same character, *he was not worth his salary.*

Boys, as you launch into life's labors, would you make your influence felt for good? Would you jog the world along just a notch by your having lived in it? Would you be missed just a little when death overtakes you, wherever that certainty may intrude? Then enter the field of life's labors *not a passenger,* for of such there is already an over load, but *enlist as an oarsman,* and guided by the intelligence that I believe God has given you, you will certainly be able to attain to some thing of the "Elements of Success."

THE FARMER OF TODAY, HIS ABILITY AND HIS RESPONSIBILITY.

MRS. EVA LEHMANN, NEOSHO, DODGE COUNTY.

As I mentally turn backward the pages in the book of time, and reflect on the vast accomplishments of the past half century made by the sturdy men and women who came to this land, then almost a wilderness, to find and make for themselves and their decendants a home; when I look again and see the old log school house with its slab seat, and puncheon floor, where many a man who has made a noble record, received his first education, then I turn again and behold these beautiful halls of learning, where the youth of our land may be reared to strong manhood and noble womanhood, if they are only willing to use their talents here, where they may come in touch with all that science has for them or that they may delve out of science for themselves. I wonder if we appreciate the work that as a growing nation devolves upon us as farmers.

Our forefathers hewed down the mighty forest and plowed the furrows across this great continent which is now bound by steel rails and electric wires. But they plowed a deeper furrow in the nation's history with such men as a Webster, a Clay or a Lincoln behind the plow share, than any man we have today with untold millions. The men who made our nation what she is today, have left their mark upon its history, and are we as a people, going to leave as distinct a mark along the lines of higher civilization? If we are, it must come from our farms and farmers' homes. For here there is a power and a mighty force behind us in living closer to nature and nature's God that should urge us on to higher attainments, and better work. We dig deep down into the bowels of the earth for its gold; we go often in poverty and rags while we hunt for the fairy pot of gold at the end of the rainbow's glitter, while the sparkling gems lie all around only waiting for us to gather them in. We groan under our work and mourn over our heavy burdens, but those who laid the foundation upon which we must build saw harder times and carried heavier burdens, for their days were long and their luxuries few but they gloried in the strength that helped them to make their homes.

We as farmers have got to feed this great land today, not only with that which will satisfy its hunger, but with its broad minded, deep thinking, strong, true men and women.

As you stand at the foot of sturdy, mighty Niagara and see the vast volume of water as it flows over that great precipice, you are lost in wonder as you begin to realize the vast reservoir that must supply this never ending torrent, you forget oft-times in your admiration and wonder that the force which lies back of all this is not alone in the great reservoirs that nature has given, but also in the constant little streams and rivers that are ever flowing in and supplying the reservoir. With its great body of water, the reservoir from which our nation draws its support and lifeblood, must be filled from the farm homes scattered all over this broad land.

To many wealth has seemingly come without effort, and we are prone as a people to look upon those who have accumulated much wealth as being the only successful ones in the world; but is this true? Is this the true standard of success? The most successful man the world ever knew, and whose name has gone down the pages of history as no other name has or ever will, said, "The foxes have holes and the birds of the air have nests but the Son of man has no where to lay his head."

I picked up these words the other day and they mean so much that I will repeat them here; "Success is the end of being all right, it is living completely the life that organism was meant to live by the law of creation." As there are many types of organism in this world there should be many kinds of successes What the world in its big generalizing way calls success is usually mixed with accident and is most often failure, judged by the law of man who made it. The largest human success is to be completely a true man or woman. The farmer may have his crops wiped out by a brief hail storm, but if he is a man, he is still a success, without a dollar and his homestead mortgaged; but take the names noisily flaunted in today's papers—are they successes? They are more often terrible remnants of man or womanhood. The ordinary citizen who lives his little life fully, with a sound body and a tranquil mind, has them beaten "to a finish."

Look at the vastness of the agricultural world today taken from the latest compiled accounts, and this does not take into account that supply that comes to the home from the things used upon our farms that are never accounted for but that which goes in as merchantable supplies. The total value of last year's crops is estimated at $6,800,000,000,

and this estimate we are told by Mr. George K. Holmes, of the Department of Agriculture is under estimated rather than over estimated. Look at the vastness of the work going on upon all sides reclaiming the waste lands, making it possible to live where its only inhabitants have been the prairie dog of corporation rule; they will not tamely submit to the elements that can be depended on to support the best traditions and to push the most hopeful reforms of American Political life. These millions of farmers will be no helpless creatures of corporation rule; they will not tamely submit to the building up of a plutocracy on the ruins of a republican institution and the Agricultural basis of the American people today both in her politics and her homes must be wider and firmer than ever before.

One of the great questions that is agitating the minds of the people today is the solving of Farm life versus City. Some tell us that to be a farmer is not as aristocratic as that of the city man or a professional man. Proud indeed are the four hundred who can trace their lineage back for three or four centuries; they do not look for the black sheep in the flock, but they flaunt (?) every great man that they can find in their ancestral tree, to be sure that they can sit with the elect. We can trace the ancestry of our occupation back to the Judean hills, aye even to the garden of Eden where the only roof was the blue dome of heaven or the forest trees. The carpet and bed the green grass that covered the hill sides.

They paint us pictures of the joys and pleasures of city life, of its many conveniences, but they fail to picture the mad rush of men for gold, of the temptations upon every hand, of its lack of true hospitality, of the grind for their daily bread, while upon the other hand they paint a dismal picture of the unappreciated farmer, his isolation from the world, his struggles to make life better for his children, so that they may be relieved of the toil which he has endured to make a living.

Has the strong hope and sturdy energy of our forefathers gone? Are we but chess men to be moved about by the whim of fate? Let us for one brief moment go back to the time when the only music to be heard was the sound of the ax, or the song of the birds of the forests; when the busy hum of the wheel or the pounding of the loom was the only recreation of many a mother; when the friendly Indian was almost a welcome relief from the monotony of every day life; when the ox team over corduroy road was the best means of locomotion and communication with the outside world and these were the elements

that went far to make our country the fair one she is today. Look at what we have now in comparison. Rapid transit, telephones, rural mail delivery, the daily papers, in fact every thing that is possible to bring the farmer in closer touch with the outside business world.

Have we in this rapid advancement forgotten that genius and industry must go hand in hand? Genius is impotent and void unless seasoned with industry, in fact true genius is applied industry. Some one asked Edison one time for his definition of genius, and he replied, "Ninety-eight per cent industry, two per cent, genius". When Chauncy M. Depew was one time asked to give the secret of his success he replied, "There is no secret to it, my friends, it is a case of dig, dig, dig," and it is very true we may inherit the fruits of our forefathers' work, and spend a season in idleness and luxury, but that does not mean success to us. If we ever add to the legacy which has been left to us, or make for ourselves a name in the world, it will be done by a close application of the principles recommended by Mr. Depew. Wealth may come to us in a day but never success. "We must build the ladder by which we climb, and mount to its summit round by round." The fairest country in the broad land today was made by the farmers, who have, with the plowshare, opened up to the great world, for the benefit of commerce and trade, these vast fields that give their bountiful supplies. And many a man like Esau of old has sold his birthright for a mess of pottage to become some second rate professional man and now has not enough left to even go back and get the husks that may be found upon the old homestead. The business world today has no use for second and third rate men, whether they be doctor, lawyer, or minister of the gospel. If you can stand upon the top round of the ladder of your chosen profession, the great world needs you and needs you badly, but there is no royal road to success, it must be work, and work of the hardest kind.

If we, as farmers, are isolated today from the outside world, who have we to blame for it but ourselves? There is a duty for each and every one of us to perform, and coupled with it a responsibility. The world never makes our opportunities for us; these we must make for ourselves, but in trying to accomplish great things sometimes are we not too often unwilling to grow? The other day I was talking with a very small boy, only five years old. He was telling me that he had been very busy working I asked him what he had been working at.

He replied, "Bringing in wood and coal for mama." "But," he said, "I had to bring the coal in in a gallon bucket." I said, "Why, my boy, was the scuttle too big for you?" His reply was, "Oh no, the scuttle was not too big, but I am not big enough for the scuttle." His little mind had solved a question that older men and women groan under every day.

And you and I must be willing to do our share, and shoulder our responsibility if we would see our nation grow and develop, even if we have to take it in a gallon bucket. To make a success of life means work, and to work with a will with some definite end in view. The world is full of beauties, good books, music, beautiful pictures, and everything to make life better and brighter, only waiting for us to make use of our talents, and use them.

The Chinaman's motto was not so bad an idea after all and we could often use it to advantage. It was said that in a large city two restaurants flourished side by side between the proprietors of which there was considerable rivalry. One of them, to call attention to the superior advantage of his establishment, put up a sign reading "Open all night". The next day, upon the front of the other restaurant appeared a large sign board bearing the legend "Never closed." Just down the street was a small Chinese laundry, and in a day or two after the appearance of the other sign boards, the laundry suddenly blossomed out with the modest statement, "Me wakee too."

There are a few brilliant people in this world whose special gift has brought to them notable success; but upon the other hand there are hundreds and thousands of us who are blessed with only an ordinary amount of brains and ability. If we are to accomplish anything worth while, it must be by little things so well done and so many of them, that they count in the sum of the world's goods as much as one great thing that someone else can do.

The great man did not attain his greatness by his talents alone; he has worked harder, perhaps, than either you or I ever dreamed of working. He is ever alert to catch a new idea or searching to discover a possible improvement, and so, like the Chinaman, let us realize that it must be "Me wakee too" to make use of our talents and use them.

Let us go into some large city and watch the moving mass of humanity as it surges along the street out of busy offices, markets and factories, each one intent upon his own business Moving along among that vast throng, you see the tired and

weary, the sad and happy. Do you see one in that vast throng who cares who you are or where you are going so long as you make no complaint or get in no body's way? Are you any more isolated in your beautiful country home where the stock look glad at your coming? Your horse gives you a kindly greeting; everything if kindly treated gives you a glad welcome. You are indeed monarch of all you survey, while in the city crowd we are but a tiny atom in the mighty mass. The larger part of that great throng, as a whole, are obliged to make their own living, and far too often live from hand to mouth that they may carry the style of the monied man or woman. While there is not a single farmer, be he ever so poor, but can have the best and most wholesome food, if he is only willing to work for it. A farmer's home should be a beautiful spot. It need not be a palace, it may only be a cottage; he may have the purest air and there they can have the greatest opportunity to make their lives better. The birds, the flowers, the trees, are all your own for the asking, and kindly Nature will give you bountifully of her fruits if we only sow and plant and care for them; and they do not need to come to us stale and second handed, but you have them in all their beauty at first cost. To be a true farmer is not to be a slave to circumstances but to be master of your own situation. Your home should be your kingdom, and father and mother the kindly rulers.

We can live without upholstered furniture, velvet carpets, or expensive oil paintings, to rest the weary brain, body and eye. But we do need love, beauty, conveniences, and the oil of contentment to grease the wheels of its machinery.

But there is something we all need in both city and country, and that is a willingness to help ourselves to a higher plane of living We need first a broader hospitality; we need to come in contact with other lives to draw out the best from them, and to develop the best we have in ourselves We need to realize that we are not living for the present alone, but for the future generations as well, and that each life is helping to make a mark on history's pages.

The world is in great need of strong, true men and women; men of principle; men whom gold will not buy; men and women of sterling worth and character, with pure, clean lives; and where can we rear them with better success than in our country homes?

We, the farmers of today, are building the foundation upon which must stand or fall the onward advancement of the rising

generation. We are feeding and clothing a vast universe. If we falter in our responsibility the jar shakes the whole financial world. I am well aware that there are two great questions that are staring us in the face today. One, the farm help, and the other, how to keep our boys and girls upon the farm. And they are of great importance. But I think in a measure they can be solved by concentration of work and shorter hours. Let us men and women be more appreciative of work when well done. Kind words help to make heavy loads very much lighter. Are we not too often afraid that words of appreciation may be given a wrong meaning and we withhold them? I have found it so often, even from wiser men than we.

I had listened to a man make a splendid address and as I was introduced to him at the end of the meeting I congratulated him upon his very interesting address he had given, when he turned and asked me what I wanted. His egotism was so large and his mind so small that he was unable to take in the thought that someone could honestly agree with him without wanting something in return for it.

But as a people are we not making some grave mistakes in advancing the theory that we must not allow the younger generation to work as we have done? The smallest boy or girl can work and is the better for having some work to do, and do it regularly. I do not believe we should overtax the mind or body of the growing boy or girl When you break the colt to the halter you are doing it for the colt's future good, not to overstrain it with work, and many a boy or girl would be a far better man or woman if they had been halter broken before they had been compelled to pull at the tugs. At the Experiment Station here today the investigators are doing all they can to eradicate from our farm seeds the smut and foul weeds, so that we, as farmers, can keep our farms free from pests. Can we, as a people, afford to let our boys and girls sow wild oats and laugh at them for having to reap the foul weeds that such a sowing brings? Many a man or woman is doing double duty today that some one may live in idleness.

In order to give to our country homes all that we can consistently give and make these places a home where we can keep our boys and girls, we must shorten the hours of labor by better methods of work; we must live a life more simple than fashion dictates; we must place before our children from their earliest childhood the best of reading; we must teach them to get the best that they can from the old masters, let it be in music

as well as books, so that these things may have more attraction for them than the card table or the down town dance-hall and its usual surroundings. Another reason why it is almost impossible to keep our boys and girls upon the farm is a lack of a properly equipped town high school. In a large portion of the state we are forced to send our children from home at an age when they need the strongest home influences, when they need to be taught little duties and given responsibilities. They come in contact constantly with those who have nothing to do after school hours are over but idle upon the streets thus getting an education that unfits them for a life of earnest work or higher ambitions. Only the stronger minds and earnest workers stand the strain, and in being obliged to send them from our homes we are placing their associates, their interest and everything away from the home and sending away from every such town its very best coming citizens.

Is there not something that we as farmers have forgotten in this rapid rush and hurry that might help us along the rougher paths? That is a willingness to help one another, not to be so jealous of others' success over ours; it would certainly make the task lighter and help to solve many a work problem. Although but a small child at the time I can still draw from memory's pages many a picture of the helpfulness of the old pioneers. I can see the great logging bees, see the winter's butchering and the spring sheep shearing, where neighbors gathered and talked crops and politics while they worked. But days have gone by, for that particular kind of work. But the days will never go by when we do not need the helping hand for every work of life.

The farmer of today must be a thinking man; he must be able to grasp the details of things that he comes in contact with, and be willing to make his every stroke count. He must be willing to learn from others and far too often there lies the secret of many a failure. We must teach ourselves to profit not alone by our own mistakes, but to see where we can profit by the mistakes of others. Experience is often a lesson dearly bought.

It has been upon our farms that the heroes of the past and the great men of the present laid the foundation for the great work they have accomplished.

With all that science, mechanism and schools have done for us, dare we say we cannot build such minds and such characters upon our farms today? Every walk in life is calling for

this class of men, and can you tell me where they can be produced better than upon our home farms?

There are several kinds of farmers today; let us look at a few of them. I met one the other day scarcely twenty-four years of age, that impressed me more than ever that there was no place quite like a farm, for a young man. He came out of a bank in England four years ago. Upon coming to this country his first place was upon a dairy farm, where they sold milk to the city. He worked two years for one man Then he thought he could earn a little more if he could rent a farm. He found a man who was willing to let him have his farm on shares just as it was, stock, machinery, etc., he to board with the man's family and to have one third of the returns of the farm. There were twenty-six cows to milk and he had to do it alone. The milk was carried to the condensed milk factory. At the end of two seasons or this fall he concluded that he would have a farm of his own, so he bought an eighty acre farm and goes upon it in the spring. I wish you could have seen his eyes snap as I did when he told me of it; clean, true, honest manhood, the world must be better for such men.

There is another class, the tired ones. Some of this class are almost tired of living. I met one of these not so long ago. His cows did not pay, but he had money in the bank. He did not believe in creamery butter; that was butter made with modern machinery. He did not believe in dairy cattle; and you would have thought so if you had seen his herd. He said that they did not pay. He was churning twice a day oftentimes, in a small barrel churn. I asked him why he did not get some better way of handling his cream as he lost so much butter fat. He said "it did not pay, the pigs got the fat anyway". I replied, "You are the first man I ever met that could afford to feed his pigs upon twenty-five cent butter fat". He had a family of nice boys and girls, but he said it did not pay to let them go any farther than the district school as it spoiled them to educate them. Do you wonder he was tired and would you be surprised if some day he found himself alone? Then there is the retired one. All honor to the man who has done his work, and with hair whitened by the winter snow, who with care and forethought, has given his children an education and put enough by to make his last days those of peace and quietude and has left behind him a record of work well done, for the younger ones to follow. But the comparatively

young man who has retired because it was too hard to work, retired to sit upon the streets and gossip and bemoan his fate because the world does not give him his just dues, and wants to run the universe when he will not milk a cow or make a garden. The would has far too many of this class, and like foul weeds and smut they must be rooted out

What must the future farmer be? First and foremost he must be a man to whom his country can look in time of danger. He must be such a clean, true man, that the best woman of our land can place her hand in his and go forth knowing that their home shall be such a place as God designed it to be; a garden of Eden in truth, with love and forbearance as their stronghold. He must be an educated man, and that does not mean in books alone, but in education so that he can see the beauties of nature, educated in such a manner that he can associate on a common ground with the best of the land, educated in such a manner that when duty calls him to serve his state or country in any form that he can do it manfully, honestly and intelligently; educated in such a manner that he can meet on a common footing the best that the minds of men can give. He must be able to know how to develop and feed those who are trusted to his care, be they his children, or his stock. He must be able to make two blades of grass grow where only one grew before; he must know how to make the soil yield her best returns at the least expense. He must make nobility of character and a higher standard of living his aim, and not the almighty dollar. But the future farmer cannot build his castle alone. There must be some one to help and make that pathway brighter, and we must have true earnest womanhood with a love of home, with an education fitting her for such a home, and home making. She must stand by him as his equal as well as his helpmate. She should be the embodiment of all that a noble woman can be.

When we as farmers have built a model home, let us remember that we are responsible for what we send forth from our farms. The richest treasures on our farms today are its boys and girls. Give to them the same thoughtful care that you do to your blooded stock. Place before them only the true and good; not only what you expect of them but what you have to give. They must be taught to make the best of every talent. Make them realize that the world is wide, and

that it has a work for them to do and expects them to do it well. What if hands are soiled and brown and faces sunbrowned, if it be honest toil, for an honest purpose. We may not be able to give to them the cities gilded pleasures, but we can give to them cheerful home surroundings and we can create in them a desire for better things. We so often hear the cry for better associations. Are we not often to blame that we do not have these associates? Are we not often enslaved to surroundings, and to habits? Innocent pleasures, happy good times are things we all need. A cheerful face and a merry laugh will go far towards keeping us all younger. You who are fathers and mothers go with your boys and girls now; let your laugh ring out just as merrily as theirs; grow up together. Spend your hard earned dollars for them now, and when they are fitted for life's work, let them earn their own. When they are older they will appreciate it better, and love you all the more.

We must educate our boys and girls, for an education means to every young man or woman, not only that which he can get a larger amount of pleasure out of life, but it is so much capital invested for them for future use, and the income they can command in their chosen profession and the worth they are to those who employ them, is the value of the investment, and it is a capital that with clean, pure lives cannot be squandered. An education or a training makes a boy or girl. Looking with contempt upon either parent or home when that home has been a good one, and the parents true, is an education down hill? We are all looking into the future for great results to be accomplished, forgetting in a measure that it is the little ones that in combination make the greater. It need not be a home of luxury and ease, but a home no matter however small, if of rough hewn logs in forests tall, in a land that is free, that makes us true men. The product of our homes today will make our nation's future history and as fathers and mothers we are responsible for the moral influence of our lives upon these same boys and girls. You breed your corn to a higher standard and you are breeding your stock to a higher standard. These may be strong words, but we mold as does a potter his clay, the lives and characters of our children in our homes and their surroundings. Blood may tell in our finely finished and blooded stock, but good feed and good surroundings will make even a scrub look much better and it is enviroment that

makes the finished man or woman. We cannot sow quack grass and reap wheat. We cannot plant Canada thistles and expect at our earliest convenience to root them up again. You cannot taint the milk without spoiling the butter. Oh how often we sow to the wind to reap with the whirl wind. Let us make our homes so true, our boys and girls such men and women that this product of our farms may be our country's richest heritage and help as tillers of the soil to make our nation still more glorious.

THE WISCONSIN EXPERIMENT ASSOCIATION AS A DISTRIBUTOR OF AGRICULTURAL THOUGHT.

PROF. G. F. SNYDER, REEDSBURG, SAUK COUNTY.

I assure you it gives me pleasure to meet you again. Since we last met I have been placed under additional obligation to your secretary and when he wrote me this winter asking me to appear upon this program I felt that I could not refuse, even if I were to discuss a topic with which any one of you is more familiar than I. I am deeply interested in the farmer and his problems; in you and the good your association is doing—but I felt more at home last year when talking to you of the country schools, than I do when talking to you of a society of which you are members and of which I am not.

During the Revolutionary war we were brought face to face with the fact that "In Union there is strength." The fact that our colonies were not closely united and had not a strong central government brought untold trouble and hardship upon the people and soldiers of that time. To remedy the trouble the Articles of Confederation were adopted but even under these the colonies were held together but as barrel staves with a thread around them. Strong minds saw the need of a real union and, after years of careful study, exchange of views, and agitation the best and most perfect con-

stitution ever adopted by a group of commonwealths was drafted and became the law of the land.

Of the wonderful industrial, commercial, agricultural, religious and educational growth there has been under that constitution I need not speak—sufficeth to say that in no country are the people freer, richer, better, less burdened with taxes and more progressive educationally than here.

A church is a union. The stronger the union the greater the possibilities for accomplishing great work. Men form societies or unions to protect and advance their interests. A corporation is but the union of hearts, heads and pocketbooks. We are all well aware of the fact that in not a few cases the union has become a power for the advancement of its own interests. Certain unions may, in their zeal to help themselves, become destructive rather than constructive in their operations. With such we have no sympathy and of such we came not here to speak.

There are unions of certain classes of individuals formed to "promote the general welfare," which from their very nature can not develop into selfishness and greed. They can but be helpful to all mankind. Of such an organization I desire to speak. Such is the Wisconsin Agricultural Experiment Association.

For many years prior to 1880 there was little improvement in agricultural conditions but with study and investigation students are now opening up new fields of interest and profit. The establishment of dairy schools and farmer's institutes started a great stride of advancement in Wisconsin.

There is still great waste in the production of food for dairy cattle and the accompanying sheep and hogs. Grains and forage crops of an inferior kind and light yields are produced. Men are just beginning to realize that more must be produced on our high priced land on which high priced labor is employed.

The wide-awake men in the Agricultural Colleges are solving the difficulty by breeding seeds and forage crops for certain qualities, with the same care which has characterized their breeding of live stock. They find that they can breed even truer to type in the plant world than is possible in the animal world. The fact that a certain kind of corn yields well on the soil, in the climate and under the conditions existing on an experimental farm is not an indication that it will do so, for instance, in the whole state of Wisconsin and the

question has arisen as to how grains adapted to the needs of the different soils, climates and conditions of the various portions of the state can be secured.

Five years ago the Secretary of your society saw the solution of the question in the boys who had worked with him and are farming in nearly every county of the state. These boys had received thorough and careful training for their life work and are the progressive members of the agricultural communities in which they live. In accordance with his thought Prof. Moore called a meeting of these boys and you all know the result. From that little gathering has grown the strongest society for the advancement of improved agricultural thought and conditions that our state has ever known. At the first meeting a constitution was adopted containing the following objects:

"To promote the agricultural interests of the state,

"First, By carrying on experiments and investigations that shall be beneficial to all parties interested in progressive farming.

"Second, To form a more perfect union between the former and present students of the Wisconsin College of Agriculture, so as to enable them to act in unison for the betterment of rural pursuits in carrying on systematic experiments along the various lines of agriculture.

"Third, By growing and disseminating among its constituency new varieties of farm seeds and plants.

"Fourth, By sending literature bearing upon agricultural investigations to its membership. And,

"Fifth, By holding an annual meeting in order to report and discuss topics and experiments beneficial to the members of the association and those interested in progressive farming."

With such purposes in view this society could not fail to be successful and is destined to grow in strength and power for good, each year.

So apparent was the need of such a society and so evident its power to uplift our agricultural interests that by an almost unanimous voice our legislature voted it an appropriation of $1000.00. It was money well spent. From a handful of men who met in South Hall five years ago the membership has grown to a thousand active members. A thousand centers from which radiate improvement in ever enlarging circles. We trust that they are the centers of ever enlarging circles of advanced educational thought along all lines.

Through attendance upon last year's meeting I gained an insight into the real work of the Agricultural Experiment Association that I am sure I could have gained in no other way.

It was interesting, as well as instructive, to hear the reports from all corners of the state on the success or failure of Silver King and Clark's yellow dent corn, soy beans, alfalfa, barley and Swedish oats. Those who made reports were, in nearly all cases, able to explain why a certain crop was a success or failure and whether or not it would be advisable to attempt to raise the crop in their section of the state next year.

Largely through the efforts of the members of your society, it has been shown that alfalfa can be grown with profit in forty counties in this state. Members have learned how, when and where to sow it. They have determined the best time and methods of cutting and a few have succeeded in maturing seed.

Again it has been found that Silver King corn—Wis. No. 7—is one of the best varieties of corn that farmers in the southern half of the state can raise. It yields many bushels of grain per acre and at the same time, because of its abundance of leaves, supplies a large amount of roughage for cattle

It has been clearly demonstrated that Oderbrucker barley is ahead of all other varieties.

Not only are the members of the society increasing the productivity of their own farms but their neighbors as well—they are missionaries scattering the gospel of pure bred seeds and increased yields.

Says the Wisconsin Agriculturist—

The members of the Experiment Association have come to be the seed producers of Wisconsin. They have not only made thorough and convincing tests of the different standard varieties of grain to determine their suitability for special sections of the state, but when once the adaptability of a variety has been proven, that variety has been retained in its pure form, produced in large quantities and sold for seed at relatively low prices, thus placing within reach of almost every farmer in the state a ready source of choice seed grain of guaranteed purity and suited to all the different conditions of soil and climate found in Wisconsin. They have established standard varieties of corn, oats and barley for every county of the state, and by dint of the most painstaking care these varieties have been produced in large quantities while retain-

ing their absolute freedom from admixture with other varieties.

No seed is given to members except such as is known to be free from contamination with foreign seeds, and all members who receive seed sign an agreement to use all precautions to prevent any form of mixing.

Not only have members increased the yield through better varieties of seeds but through the proper care of seed as well. They have used and shown others how to use the formaldehyde treatment for potato scab and oat smut, thus saving millions of dollars to Wisconsin farmers alone.

Men who one day ridiculed the College of Agriculture and its book farmers are learning that there is something "doing" down there. They see the evidence of it on the farm of Neighbor Jones, who is a graduate of the college. The quiet work of the graduates on the farms scattered throughout the Badger State is convincing doubters and critics more than can books, papers and lectures that there is real value and profit in going to school to learn how to farm and that study and experimentation can be applied to no occupation more profitably than to farming.

When a farmer sees a good crop across the road he makes inquiry as to the source and kind of seed, the care of the seed and growing plant. He catches the spirit and gets some seed and passes the good word along and many there are who profit by the original experiments and care of the few.

Truly the day is at hand when we may sing as did the poet:—

"I'm glad I am a farmer
The sturdy plow to wield,
Or cradle down the ripened grain
That waves in yonder field."

HIGH IDEAS IN BUSINESS.

C. H. HILL, Rosendale, Fond du Lac County.

In the few moments of time that your program committee have so kindly assigned me, I wish to speak to you on High Ideals in Business.

Your Association has taken up a fine line of work in its attempt to supply better farm seeds, and the work you can do can be of inestimable value, but at the same time it may be possible to work inestimable harm through the spreading of noxious weeds over this and other states.

I think I see the time approaching when anyone who has good reliable farm seeds for sale, free from noxious weed seed, and for pure bred stock, will be able to command several times the price of ordinary seed grain.

The state is rapidly becoming sown with noxious weeds, and few farms are entirely free of them.

If you plan to raise any of the kinds of seeds that will carry foul seed, and all seed will carry some except corn, will it not pay you each year to summer fallow one piece and get your seed grain fields entirely free of all weeds. In a short time you will be able to command a price for your seed grain that will be as much in excess of what your neighbor can get, as the best breeder of any of the breeds of live stock is able to get for his animals over and above that of the breeder who has nothing to say about his stock except it can be registered.

Seed breeders, or live stock breeders who misrepresent their stock will very soon be out of business, and will have a name all over the country for dishonesty.

The different Live Stock Breed Associations have to be constantly investigating charges against breeders for misrepresentation and fraud in sale of stock, and deny men proven guilty the further use of the Register.

After one charge is made against a man, he is watched more closely and if guilty he is soon caught.

The common thought is at the best "Honesty is the best policy." Therefore be honest. This is true, but be honest because it is right, and policy will not bother you.

Stand back of every representation you make about your goods.

Note the enormous business built up by the great Mail Order houses, and the chief element in their success is that they take back any thing unsatisfactory, no matter if it is you who have made a mistake in ordering.

If you guarantee everything as represented you will be more careful what you send out and buyers will be more easily satisfied for he will not be looking for holes.

Strive to breed the best seeds, the best live stock in your community, deal honestly with your customers, and stand ready to cheerfully correct mistakes and in a few years your trade will exceed your fondest expectations, and you will have the satisfaction of having done well, and benefited mankind.

"RURAL TELEPHONES"

H. E. ROSENOW, OCONOMOWOC, WAUKESHA COUNTY.

Rural life to-day, with its interurban electric lines, its rural free delivery postal service and the rural telephone, should be the envy of the greater portion of mankind. The farmhouse has become the suburban residence rather than an isolated and companionless abode. While these facilities are not yet establshed in all parts of the country, the progress is such that the next ten years bids fair to see the almost universal use of these modern necessities and conveniences of the American farmer.

To secure any of the necessities and conveniences of life it is necessary for some effort on the part of those to be benefited, especially true, as regards the rural telephone. Patents were issued on the magnet telephone in 1876 and it was not until the latter part of the nineties that this invention was beginning to be utilized to any great extent outside of the larger cities, and this was due to patent protection. In securing the patent on his invention Alexander Graham Bell described the telephone as an instrument for the transmission of articu-

late speech by electric current; and because of this fortunate form of words, which covered the process as well as the device, he was able to maintain a complete monoply of the telephone business, until the expiration of his patent rights, seventeen years later. Since this time, the manufacture has been taken up more and more by independent concerns, and today we have thousands of operating companies and also many more independent subscribers than the original Bell Monopoly which has had full control of the field for so long a time and has held the rates so high that until recent years very few lines were built for the benefit of the rural population, and most of the lines in the country today are the outcome of the efforts of the local residents themselves. It is estimated that telephones have been put into nearly half a million rural homes during the past five years. There are still several million farmers yet to be reached.

We might say that since the pioneer days of the reaper there has probably been no one device brought out, of such incalculable assistance to the farmer as the teleqhone. The age is replete with glorious achievements for pleasure and profit, and our rural population is rising to a keen apreciation of its opportunities as never before. Among the privileges to which we have been so long and richly entitled, comes the service of the telephone, which is no longer a mystery nor an experiment. It is a popular, practical and profitable proposition, proven by usage beyond the peradventure of a doubt. The up-to-date farmer needs a telephone in his business just as much as city folks in theirs; if anything, more so, because distances in the country are usually greater and more time is consumed in getting to and from points with which communication is desired.

It does not seem necessary to take up any more time in discussing the advantages of the rural telephone, for as a matter of fact, we cannot fully measure them in their entirety or fully apreciate to the greatest extent the good things that they bring upon our farms.

A conscious security comes to the family through the assurance that they have ever at hand a tireless and trusty servant to run their errands. In time of danger or pressing need, a messenger as swift as lightning flashes can be summoned to their aid. One cannot fully comprehend the full value of a telephone in the house until he has had the real experience of it. A few more of its advantages are in the getting of better

market prices. It keeps patrons in quick touch with all the news, not only in their own neighborhood, but all over the country. It will do the visiting and make the social calls without the trouble of "dressing up" and taking a dusty, sultry or freezing ride It will keep away insolent tramps and prowling burglars, and also put subscribers in direct and constant communication with the merchants, doctors and all other business men in town. Arrangements may be made with the Weather Bureau for the delivery of the daily weather forecasts to the local telegraph office from where they are transmitted to the rural subscribers central station and may then be given out on each line by means of a general call for all subscribers on a line. All things considered, it makes home happier, brighter, and more delightful in a thousand different ways.

After one is convinced and decides that he must have telephone connections, the next thing is to get your neighbors interested and arrange for the organization of a company, or if one does not care to take the matter in hand personally, you may succeed in getting a nearby company to solicit subscribers and build the lines; but the cheaper way is for the farmers to organize and build their own lines.

After one is assured the interest of others in the vicinity, it is best to call a meeting and discuss the matter fully, then proceed to elect a temporary chairman and secretary, determine the number of possible subscribers within a given territory; appoint a committee to investigate as to the cost of material and also in regard to other line connections. A mistake is often made in organizing rural companies in not conferring with the manager of the nearest city or town exchange. He has usually had years of experience and will give you good advice, and you will also want to connect with his exchange so as to get the full value of your undertaking.

After being satisfied that sufficient money can be raised to assure the success of the undertaking, it will be necessary to fully organize your company, first to decide whether it shall be on the mutual or co-operative plan or whether to incorporate and effect a regular organization.

This latter method is doubtless the better way and the most business-like, so it will be necessary to secure the proper blanks from the Secretary of State, fill out and file same and get your Articles of Association, but do not make the mistake of having your capital stock too small as you will then be at an extra expense for making an increase, as your business is

bound to grow. Previous to incorporating your company it will be necessary to adopt a constitution and by-laws, which should have been previously drawn up by a committee for that purpose; copies may be obtained from other operating companies and telephone manufacturers for comparison and an aid in your work.

After having adopted your constitution and by-laws, elect the necessary officers and have them take charge of all the affairs of the company.

If possible, make a connecting contract with the company operating the nearest exchange or the one where most business will be transacted and thus also secure your long distance toll line connections, as without this the value of the rural 'phone is not half realized. Satisfactory connections can generally be made, whether it be Indepenlent or Bell companies. In case of the latter it is necessary, at the present time, to rent a part of the instrument, but the balance of the same may be purchased.

Now after having completed your organization and having sufficient amount of stock subscribed also the long distance connections arranged for, the next step will be to secure contracts for telephone subscribers, which should be for a period of one or more years at good rates; for country party lines the same will range from twelve to fifteen dollars per year, cheaper rates generally mean poor service or poor long distance connections; sometimes shareholders may arrange to furnish service to those holding sufficient stock at a much lower rate or perhaps free if the income from other sources proves sufficient for operation and maintenance.

After having secured the necessary subscribers and a general outline of the territory to be covered together with the right of way for same; the next and hardest proposition is the construction of the lines, the material to be bought and the labor employed. In the construction of rural telephone lines there is nothing difficult or complicated. This is especially true of small systems, very large and far-reaching systems should be built under the direction of a competent engineer or by a construction company. A majorty of the existing rural systems furnish all the proof necessary that the farmer is competent to build his own lines. If your proposed system is a small one with all of the subscribers in the immediate neighborhood so that all will be on one line, and if this can be connected with some nearby exchange, then you

will have a system easily managed; but if your proposed subscribers cover considerable territory and require several lines running to some central point and there connected to a switchboard, then it is a more difficult proposition to manage, but you will have the ideal telephone system which will increase in number of subscribers beyond all expectations, and the more subscribers the more valuable will be your telephone service. In arranging for a central station, the first and one of the most difficult problems confronting the builder is the laying out of the pole lines; they should be run so as to require the minimum amount of poles and wire, and getting as nearly as possible to the logical center of the territory as indicated by the location of prospective patrons. The larger poles and cross arms being used near the central, while out at the further extremity of the lines brackets are used. Cedar poles are preferable. Those having a five inch diameter at the top and twenty and twenty-five feet long, using the longer pole in crossing drives and roads. Poles should be roofed at top and set about four feet, using thirty-two to the mile.

A list of all other material together with tools needed should be purchased; first deciding on whether the lines are to be grounded or metallic, the latter, which requires two wires for each circuit is far the most preferable especially if long distance connections are to be obtained.

The number 12 B. B. galvanic telephone wire (not fence wire) should be used; same requires 165 pounds to the mile for each wire. Where there is any possibility of using more than two wires, cross arms should be used in place of brackets, laterals may be run from the main line for securing several subscribers and on such occasions brackets are sufficient. In connection with the use of crossarms, other material needed is such as pins, insulators, braces, carriage bolts, lag screws and center bolts, or for the smaller arms, the braces and bolts may be dispensed with by using steel gains with center bolts. Particular attention should be given to all corner poles and have the same held in place with guy anchors so as to prevent wires becoming loose. Two or three men are most satisfactory for the construction of local country lines; and besides the digging tools required, they need two sets of tackle blocks and rope (one large and one small, the large one being used in construction and the small for repair work and for short spans), two stretching clamps (or buffalo grips are most popular) one equalizing pully, splicing clamp, pliers, blow

torch, climbers, safety belts and tree trimmers, and after having gained a little practice good headway will be made

In regard to cost of material, one can hardly make an exact figure as market prices continue to climb, five inch twenty foot poles will cost at present in this locality about 85 cents; five inch twenty-five foot $1.05, brackets, insulators and pins nearly two cents each, number 12 B. B. wire four to four and one fourth cents a pound according to quantity bought. The smaller cross arms will cost from twenty to thirty cents each, braces and bolts additional, setting poles about twenty-five to thirty cents each; stretching wire and trimming trees will average about $2 to $3 per mile for one metallic line. Insulated copper wire for house wiring will cost from one to two cents per foot; the best method being to secure prices from the supply houses for all material needed and thus make comparisons and estimate cost before placing orders.

After all outside construction work is completed, the next step is the installation of 'phones. This part of the work is also easily accomplished after one has gained a little practice and studied the business somewhat. The instruments should be investigated beforehand so to decide on which particular make is wanted, but care should be taken and not get onto the idea that any kind of a 'phone will do. The one object being to secure uniformity. The style of 'phone depends on the wants in each particular case, the automatic system giving absolute secret service, but this system is not practical for rural service as for cities. The lock out device is used somewhat in connection with country lines but the most common system is the rural party line with a code of signals. To get the most satisfactory service it is best to place not over fifteen on a line,. although this depends somewhat on the number of calls made by different subscribers as some will use the a 'phone more than others and if too many are on the same line, chances are that when you want to use it you will be told that the line is busy. As far as the working of instruments is concerned they will work perfectly with thirty or forty on a line, provided, however, they are of the style needed for this number of subscribers, those most commonly used are of the magneto, bridging, compact type with a five bar generator and 1,600 ohm resistance ringer. A great improvement may be had in the service if same are equipped with condensers, which will enable one to call any subscriber regardless to position of all other receivers on the line otherwise

you cannot ring by a receiver that is off the hook. Another improvement is the grounding key or push button attachment for calling central secretly, as you ring no bells on the line when calling central but to complete this arrangement it is necessary to ground one side of the jack at the switchboard. The extra cost of this method is only 25 cents per 'phone and in the system you use only one wire and the ground for calling but the talking circuit still remains metallic and another valuable feature is that you can call any subscriber on your line without calling or disturbing central. The selective ringing system is used to some extent but is more complicated and expensive, and not more than eight can be put on any one line. With this system it is necessary to call central in order to get any subscriber whether on the same line or not, thus causing more work for the operator at central. The matter of selection of a switchboard is largely a matter of the company and may be best determined by the requirements as to number of lines to be installed and from other information gained from different manufacturers.

Rural lines are more subject to lightning discharges than city lines but most all instruments are amply protected with carbon arresters and this connected to a good grounding will in most instances prevent instruments from being damaged.

Good service is the best aid to successful telephone business and with the proper attention to switchboard day or night and with a good set of rules for the party lines and a strict adherence to same there will be little cause for complaint in this respect.

Proper maintenance is another important question, as without it a system, no matter how successful at first will soon go to wreck. Officers should attend to employing labor for any repair work and trouble of fixing which may come up at any time the same of which should be attended to promptly.

All persons interested in forming rural companies and all officers and employees of such companies should subscribe for some good Telephone Journal and keep posted on all literature in relation to the subject.

Those who still lack telephone service in their neighborhood will find it to their advantage to go after it. The telephone is now a necessity, not a luxury.

THE AGRICULTURAL PRESS AND THE WISCONSIN EXPERIMENT ASSOCIATION.

A. J. MEYER, HOWELL, MICHIGAN.

The farm paper exists primarily for the purpose of making money for its publisher, just as you raise pure bred livestock or grow pure bred seeds for the sake of the dollars it puts into your own pockets. As an association we are adding hundreds of thousands of dollars annually to the actual wealth of the state, and it is only a relatively small portion of this added wealth which remains within the membership of our organization. Yet we know that this society or any other one would be all ready for the undertaker in mighty short order, were it not for the immediate material good which each member derives from it by virtue of that membership.

This fact, however, does not detract in the slightest from the importance of our association for the general advancement of the public good. The same holds true of the agricultural press, and for our purposes here and today we can afford to forget its function as a private enterprise, which concerns us little, and consider it purely and simply as a public utility, which concerns us very much.

The agricultural press is the agricultural college of the masses. It numbers its students by hundreds of thousands. It does not ask the people to come to it; it goes to them. It asks no questions of age, nativity or scholastic attainment; its courses are open to everybody for twelve months in the year. Its faculty is chosen from the most wideawake college professors and experiment station workers of the country, from the leaders of the various farmers' societies and breeders' organizations, from the most intelligent and practical farmers the world over. Its teachings are not the product of cut and dried formulas, which dribble out to the world through a wilderness of red tape. It is prompt. The teachings of today are determined by the conditions of yesterday, and the demands of tomorrow. A farm paper worthy of the name is timely. Its lessons do not carry the taint of cold storage, nor do they require a preservative to keep them until needed for use. Its courses are graded to accommodate all people at all seasons of the year.

Now I want to speak very briefly of another function of the agricultural press which at times is quite as important as the one we have just considered. I refer to its function as a shaper of public opinion and an organizer of men. Co-operation is the watchword of today. No one is in a better position to realize this than are the members of this society. Our reputation as a great dairy state is the result of co-operation; our reputation as a great seed growing state which our secretary has scheduled to appear not many moons hence, will depend upon co-operation; and, in either case, co-operation must be the result of uniformity of ideas and ideals. I speak only of the broad, general principles; there are innumerable influences which determine the lesser details and among these the personal characteristics of the man are the foremost consideration. But before there can be any general concentration of ideas in a certain positive and definite direction, there must be some central organizing influence. There are usually a number of contributors to this influence, but the independent agent of all of them is the agricultural press. It does not execute its campaign on the plan of the stump orator who is here this week there next week and somewhere else the week after. The farm paper keeps up a continuous campaign—this week, next week, and every week. It not only plows the soil of public opinion but it subsoils and harrows, it sows the seed, it cultivates the growing crop and it stays right by the game until the crop is harvested.

So much for the agricultural press as a public utility; let us turn the same search light upon our Experiment Association and "see what we can see." I have already referred to our society as contributing largely to Wisconsin's total agricultural wealth. I have in mind then, direct contributions in the form of better varieties of seeds. It has always seemed to me, however, and time only serves to strengthen my belief that we are neglecting a consideration that should be a leading one with our society. Our work in developing and testing new varieties of grains and forage plants is progressing as it should. We cannot afford to relax for a moment in this work, the possibilities of which we have hardly touched upon. But let us keep ever in mind that in the upbuilding of a symmetrical system of agriculture, good seed is only one of the essentials. The problems of growing, harvesting, marketing and seed selection have been solved by a relatively small proportion of the rank and file of farmers. Every bushel of choice seed that you send out

to a farmer who does not know how to care for it from the preparation of the soil to receive it, to the selection of seed for the next year's planting, is a bushel of good seed practically thrown away. If the individual interests of the member who sells this seed represent the sum total of his interests in this society, he will have no reason to regret the transaction. However, we receive money from the state and are now asking for more money on the basis of making our every move of largest benefit to the greatest number. We can do this most completely by exercising every means in our power to build up not one feature of agriculture, but all related features at one time. I can see no reason why our organization should not lead other organizations of its kind in the promotion of all lines of farming.

And this brings me back to the agricultural press and the consideration of its relation to the Experiment Association. Permit me to draw an illustration, by way of comparison: The oldest farmers' society in this state is the Dairymen's Association. It has worked wonders in the development of our dairy industry. But it has not accomplished its work, by merely meeting in annual convention and discussing topics of interest to the industry. Its members have pounded away through the medium of the agricultural press every month in the year and every year since its inception. Many of them sell pure bred and high grade dairy cows and by doing this have increased the wealth of the state, to the extent of millions. But this has been only a small part of their work. The men who organized the society and who are supporting it today were men who recognized that there is more to dairying than rearing and distributing dairy cattle They have not only offered the people of Wisconsin and the United States good cattle, but they have taught what crops to grow in order to feed those cattle, how to care for them so as to prevent their degeneration, how to breed them so as to keep the blood lines pure. They have gone on beyond this and taught how to care for the milk produced by these dairy cattle and how best to market the finished product of the dairy. Nor has this work been done entirely or even in large part by the association acting as a body. It has been mostly the work of individuals who felt that membership in the Wisconsin Dairymen's association imposed certain responsibilities and they have met those responsibilites fairly and squarely at all times.

In alluding thus to the means by which the oldest farmers' society in the state has attained to its present honored position,

I am reciting nothing that is new to anyone here. The fact remains that its success is in large measure due to the intimate relations which have always existed between its membership and the agricultural press, and the leading thought I want to leave with the members of this society is that their example is worthy of imitation.

FARMERS' ORGANIZATIONS AIDED BY MEMBERS OF THE EXPERIMENT ASSOCIATION.

W. H. HANCHETT—SPARTA, MONROE COUNTY.

The question of aiding is one which requires as a first consideration a realization and knowledge of those conditions where aid will be of material value. Such being the case it may be well in dealing with this subject to first consider some of the conditions and difficulties which tend to shipwreck Farmers' Organizations.

A popular writer of the present day, in describing a certain political era of our American history, has said, "Certain gentlemen with a pious belief in Democracy, but with a firmer determination to rise and get on top, arose,.....and got on top. So many of these gentlemen arose in the different states, and they were so clever, and they found so many chinks in the Constitution to crawl through and steal the peoples' chestnuts, that the era may be called the Boss Era."

Farmers' organizations are essentially democratic, and such being the case, are subject to political eras, differing only with the political eras of our nation in that being of a local character, both chinks and chestnuts are immediately under our observation and hence more easily watched. I believe, in fact, that one of the gravest dangers to farmers' organizations are the political campaigns waged in their midst by designing persons for their own personal gain. If you doubt this statement look up the history of most any Agricultural Society, Co-operative Creamery, or other Farmers Organization that handles considerable amounts of the peoples money and see if sometime in its history it has not been put through a "Boss Era" by "certain gentlemen" with a determination to get on top, who waged

a hot political campaign to get themselves in control of its affairs. Then follow this history just one step farther and see if these same gentlemen did not fail to give a full account of the affairs of the Organization to its members.

Unbusiness like methods, inadequate systems of accounting and careless bookeeping are also sources of considerable danger to such organizations as handle considerable sums of money. The chronic kicker, the petty jealousies, the unjust suspicions, and the indifference of large numbers of the Agricultural classes to the benefits of organized efforts along different lines of development, are all factors that we must deal with as well as the dishonest designs of those selfish enough to seek only their own personal gain.

My subject presupposes the desirability of Farmers Organizations so a discussion on that point is unnecessary, the question before us is, what can we as individual members of this organization do to aid in the work. I wish to quote here some advice that I in company with some fifty odd young men received up in old South Hall back in the spring of '98. It was this, "Young men, go back to your homes and show by the farming you do rather than by word of mouth that you have been to an Agricultural College." This I have found was good advice and I believe the majority of young men who go out from the Wisconsin Agricultural College cherish every word of it, and will agree with me that we are not to aid with windy arguments but by quiet, determined, thorough, concientious work.

Just what the work is to be will depend largely on circumstances. Probably the greatest need in farmers' organizations in the way of workers is a few tactfull persons who will put self in the background and study and work to harmonize contending factions that are most sure to spring up, some one who, through investigation and careful study, will see the threatening storm before it breaks and who has the tact to quietly avoid the threatened calamity. This is a part that requires careful study, not only of the work undertaken by the organization, but of the individuality of its members, and ought to be an interesting part for those who have been through our Agricultural College and received instruction in this fascinating study of individuality and type, which applies to the human as well as to the beast.

The training received here in the Agricultural College by the members of this association, in other lines are also such as should make them efficient workers in other respects, but let us always keep this thought in view, that it is the work we are go-

ing to push and not ourselves, and if we are to become prominent in a farmers organization, let it be from the results of the good work we have done rather than the results of successful political manipulation.

Perhaps a few suggestive thoughts as to just how to work might not be out of place here. We find ourselves in a farming community perhaps where a co-operative association of some sort would be of great value. It may be a creamery, a cheese factory, a telephone system, or some kindred association work that is needed. The same principles will apply in each case. The first step should always be thorough investigation and in this we will do well to get several of our best farming neighbors to take part for if the investigation is properly conducted the result will be that we shall have several strong allies in pushing the work at its close. The close of this investigation should find us well equipped with a fund of information regarding the proposed organization in all its phases, and if we have been wise enough to get our neighbors interested in the gathering of this information we will have made the required number of converts to commence the perfecting of the same at once. Here let me drop a caution—some promoter will have by this time got wind of the intended action and will be on hand to force himself upon the deal,—let us insist that he go home and quietly refuse to go any further with the work until he does. The organization once launched, the work of harmonizing the pretty sure to be the dominating influence although he never portant. One of the best workers that it has ever been my privilege to work with in this regard never was known to advance an opinion of his own, but was always ready with a fund of information that led others to embrace his unexpressed opinions in the matter, so that his well founded opinions were pretty sure to be the dominating influence although he never personally put them in words. The fund of information which we have gathered ought to enable us to be equally as tactful, being careful at all times to use as little as possible the personal pronoun of the first person singular.

OFFICAL TESTS OF DAIRY COWS.

ROY T. HARRIS, ASSISTANT IN DAIRY TESTS, WISCONSIN EXPERIMENT STATION.

In this paper I have thought best to make no attempt to go deeply into the subject of "Official Tests of Dairy Cows," for the subject is a large one and several phases of it are to be presented to the members of this Association and the Farmers Course by those better qualified to do justice to the subject. I shall address my few remarks more especially to the beginner,—the young man who has not yet taken up "Official" work, and who, perhaps, does not know what it is or the advantages to be derived therefrom. So let it be an exhortion to such to take up the work, both for the probable pecuniary benefit and the educational value, which last is one of the greatest items with the beginner.

"Official Tests" are tests conducted under the complete supervision of an Experiment Station. Several of the cattle clubs have set up standards of dairy production that they consider high marks, to be reached only by cows of more than ordinary dairy quality. Such cows as succeed in passing these requirements are given place in what is called an "Advanced Register" or "Register of Merit." From this list of superior animals, breeders will select those that have shown themselves of greatest excellence, hoping that the same good qualities will be transmitted to the off-spring and continued in succeeding generations. We have the same reasoning back of our methods for improving our varieties of corn, barley, etc. We select the specimens approaching most closely to our ideal and continue a weeding-out process until we have eliminated imperfections and fixed the desired good qualities.

In seeking admission to the Advanced Register, the cows stand as candidates for an advanced degree, but who shall pass upon their qualifications? Not the owner, for he may be unduly biased by pecuniary interest. And not the cattle clubs, even, for they may be too lenient and the desire to make a large showing for their breed may tempt them to err on the side of liberality. So the State Experiment Station is called upon to act as an impartial umpire upon the performance of the candidates,—all breeds being on an equal footing.

The tests are conducted as follows: An owner has a number of cows that he considers capable of passing the requirements and applies to the Station. An official, or authorized representative of the Station, is sent to the farm and there personally watches every milking for the required number of days; weighs the milk; takes samples; and tests same for butter-fat by the Babcock test. At the close of the test, the supervisor must certify to the accuracy of the record and that all rules of the Station and cattle club have been fully complied with in every particular. The Station vouches for these records to the secretary of the advanced register of the club and the cows are accepted or rejected, as the case may be, on basis of their actual performance.

Most official tests run for seven days, with a lesser number for thirty days or longer, and are made when the cows are at maximum production,—usually within the first month after freshening. Cows are kept under the best possible conditions and offered every encouragement to give a large flow of rich milk. Kindness and regularity are watchwords on farms where successful tests are conducted and no loud noise or other disturbance is permitted anywhere near the "test cows." The whole family is usually interested in the work and can hardly wait for the completion of each test to find out how the cows are running. Toward the close of extra high records, I have often worked till after ten o'clock at night testing the evening samples, for no one seemed inclined to sleep with the amount of the day's credits unsettled Personal interest in dairy cows, and all thereunto pertaining, is the great secret of success in breeding, rearing and handling them, and without it there can never be success worthy of the name. Among the many benefits conferred by the systems of dairy tests, this is one of the greatest. They have added much to the interest in the work and have shown us in many ways that the cow appreciates small attentions and will return abundantly for a little extra care. One must be dull indeed, who can closely watch the daily work of a good dairy cow through a long test, without increased respect for this delicate and highly specialized machine and for the finished product therefrom.

We think of milk as a natural secretion,—and such it is,—but it takes energy to produce this secretion,—to break down the food, separating it into its various elements, and once more gathering the choicer ones together and building them up into this finer and purer product. The energy is not expended in

drawing heavy loads but is utilized just as truly in one way as in the other. In heavy work a cow lies down a great deal and seems at peace with all the world and to enjoy the laziest life imaginable, but she is at work all the time preparing and storing that which is to support the labors of others and renew the energy used in other bodies than her own. Her eyes are bright and skin soft and healthy, and, in every way, she is a picture of health and vigor. She is little inclined to physical exercise and really seems to feel the lack of it very little. When the exact production is known and the feed and other conditions are closely watched, we soon note variations in the production from milking to milking and day to day and try to explain them. If a certain circumstance, such as the presence of strangers during milking, is found to be, in nearly every case, followed by decreased production, we have some grounds for believing such conditions unfavorable to milk production. I may say that we do really find that apparently slight disturbances affect the yield,—are paid for in lessened production,—and that one day's neglect requires several of extra attention as compensation. There are often variations that we cannot account for, but this is because, in the present state of our knowledge, we cannot know all the conditions and their bearing on each case. From my own experience and observation, I submit the following conditions as essential to maximum results:

1. Plenty of pure air and sunlight.

By proper systems of ventilation, we are able to supply the former and we may, at least, so construct our stables as to admit the latter with proper control.

2. An abundance and variety of palatable feeds combined in such proportion as may best suit the appetite and needs of the cow.

In feeding for maximum production, more protein is usually fed than would be profitable under ordinary dairy conditions, where we should expect the milk and butter to pay a profit over cost of feed. The advantage derived from a large record is often so great that the cost of feed is an item hardly to be considered. As one breeder said, "If that cow will only give me the butter-fat, I stand ready to give her everything she wants in the way of feed." As a matter of fact, he was a little overliberal, gave her more rich feed than she could take care of, and only extra care and a vigorous constitution saved the cow from going to pieces in the middle of the test.

3. Freedom from all disturbances.

Sudden noises, loud or rough talking, and running about are to be avoided. Anything that attracts the attention too suddenly is bad. Strangers should not be admitted to the stable more than necessary and never at milking-time.

4. Regularity in everything.

Feeding, milking, etc., right on time and always in the same way.

Now as to the benefits of testing. As we have endeavored to show, it brings a better understanding of the cow and her needs, and increased interest in the business. It is the very best means of advertising and the cheapest, for the value of tested cows is enough greater than those without records to nearly or quite pay all the cost It sometimes pays a profit besides. Official tests establish confidence, since, as now conducted, they are practically above suspicion. Above all they are of greatest value in determining which strains and combinations have proven best,—judged by actual performance.

Tests covering longer periods of time are now becoming most popular. In these the Station representative conducts tests for one or two days each month, the average test for this time being taken to apply to the whole month. The owner furnishes a certified statement of the milk given, which is multiplied by the Station's test to give the total fat for the month and year. These are called "Semi-Official" tests and are considered a much better showing of a cow's real value for the dairy than tests for short periods during the flush. They are also hedged about with many safe-guards, making them reliable.

COOPERATION OF THE SHORT COURSE ALUMNI WITH THE WISCONSIN EXPERIMENT ASSOCIATION.

E. E. JONES, ROCKLAND, LA CROSSE COUNTY.

I am safe in making the assertion that when the Short Course in Agriculture was organized that it should serve as a stepping stone to a higher field of agricultural education. The Course is complete, but as the time spent here at the college is so limited and the amount of work is so comprehensive that we can only at best, get but a good start along our chosen vocation. No one should go out of this college at the completion of the course with the idea in his mind that he has learned all about agriculture. After finishing the Short Course we should keep in close touch with the college and there is no better way of doing this than to become a member of the Short Course Alumni and the Wisconsin Experiment Association.

The Experiment Association was organized only five years ago and is now the largest organization of its kind in the United States, has done more good to the agricultural interests of the state than any other federation in so short a time. The method of treating seed oats for the prevention of smut alone has saved the farmers of the state millions of dollars during the past few years. We have the selected seed grains, oats, barley, and corn that have been carefully tested and found to be the standard varieties for Wisconsin. Farmers of the state are awakening to the fact that, in order to succeed they must improve their farm grains and are desirous of obtaining better varieties of seed. I am pleased to state that the members of the Experiment Association throughout the state are raising and selling more seeds to farmers in the state and outside of the state than is being done in any one other state in the same way in the Union. This alone has brought Wisconsin more in return than the entire agricultural college and its equipment has cost the state. Remember, that is only one department that I referred to. We should also take into consideration what the other departments are doing; the Soil Physics Department through the tile drainage of marshes that have been heretofore worthless has converted them into tillable condition. There is also the

Dairy Department which by sending trained young men out to act as operators of creameries and cheese factories of the state, has made Wisconsin one of the great dairy states of America.

In concluding I wish to state that every Short Course graduate who is not taking advantage of the opportunities offered him by the Experiment Association is not true to his chosen profession. I know that some of them look upon these annual gatherings of the Experiment Association and Alumni as useless expense. I can say for myself that I have attended every annual meeting of the Experiment Association since its organization and can truly say that I have been amply repaid by procuring seed and carrying on experiments and while I have been benefited, can say that I have been the means of benefiting my neighbors by furnishing them seed that has proven to be a good investment for them.

Before I close, however, I wish to say a word about the Short Course Alumni. While we have quite a large membership I would like to see it doubled and more of an interest taken in our annual meetings and banquet. We have no programs for our annual meetings as we are so closely affiliated with the Experiment Association, the officers have decided that our meetings be a business meeting only, and that our Annual Banquet shall serve as a place where we can get together, renew old acquaintanceship and have a good, jolly old time. I would be pleased to have every alumnus present at the banquet tonight, as we have arranged a good program and all who come will be pleased with the evening spent at our banquet.

OPPORTUNITIES FOR YOUNG FARMERS IN THE WEST.

E. W. LEE, GRANTON, CLARK COUNTY.

Opportunities for young farmers in the west is a pretty big subject and in order to cover it well would compel me to spread out more than a mother hen trying to cover a brood of about one hundred chicks.

For some reason when we people in Wisconsin speak of the west we, i. e., the most of us, do not realize what a vast scope of country lies west of the Mississippi river. We do not realize how small Wisconsin is until we get west of the Rocky Mountains and think how little she looks on the map as compared with California or any other state west of the Mississippi. But, although Wisconsin is small, God bless her, she offers as many opportunities to the young farmer as any of them.

As it was intended that this subject should give the opportunities of the Wisconsin farmer, I should like to take up each phase of the subject separately, but neither time nor space will permit.

I believe that when the Wisconsin farmer sells out, leaves home and friends, and goes west he is missing his greatest opportunity. There is no question but that there is a grand future for Wisconsin as a breeding center for all kinds of stock and seed grains. While in the east last spring I found some people who, even now, recognize this as a state where fine stock and the best of grains may be had, and yet we are only in our infancy in that line. To be sure it requires capital to get a start here, but I could not or rather did not find a place between the Atlantic and the Pacific that it did not require capital to get a start. Land in the desirable sections of the west is exceptionally high. Dairy products command a good price but feed and labor are correspondingly high so that the net profit is about the same as it is here. For the young farmer with no capital, I consider the country west of the Rocky Mountains a very poor place, as the laboring man is not, as a rule, looked upon as an equal with his employer. The laborer does not associate with his employer as a general rule. Instead of going into a family as one of them, the young farmer working for wages, is more of a machine, and is treated as such, for when

his day's work is done he must roll up in his blanket in most any shed or out in the open if he chooses to do so.

You young men who are looking for opportunities and want a nice climate, go west, but do not expect to find the comforts of a home unless you have money enough to buy them. If you expect to buy land you can probably find some good opportunities in the west, but before buying a cheap tract, study it well; it may be possible that it can't be watered, or the water may cost more than the crops would be worth. Alkali may crop out in many places, and thus reduce the profit, so if you intend to buy land in the west take plenty of time for not all the land there is good and real estate dealers are not all followers of the Golden Rule. Up in the San valley of California some of the large ranches are being divided and sold out in small farms. There are some good opportunities for some men to go into the fruit business or to raising alfalfa and stock but when we figure the cost of moving such long distances and taking the risk of getting something of value; is the opportunity any greater than that which lies at our very door? I think not. I know men who left here with money and went west seeking better opportunities who are now back here working by the day to earn money to support their families. In conclusion let me say to all who are thinking of looking for opportunities in the west, look at home first and see well what you are leaving before going too far.

IMPORTANCE OF THE CORN CROP TO WISCONSIN FARMERS.

W. S. MARSHALL, DELTON, SAUK COUNTY.

Does the Wisconsin farmer realize that the corn field is a gold mine? A gold mine that needs only an earnest, intelligent working to outyield the mines of Alaska. We have become so accustomed to hearing of the Corn belt as a specially favored country, lying to the south and southwest of us, where alone it is profitable to engage in corn culture that our Wisconsin farmers, as a class have not given corn the attention it deserves. The Wisconsin Experiment Association has been quietly at work for the past five years pushing a campaign of education, of demonstration. They have preached the gospel of corn and their work is attract ing attention and showing results that are phenomenal. The acreage of corn in Wisconsin in 1905 was nearly one and one-half million acres, the production for the state nearly fifty-five and one-half million bushels. The average yield per acre was over thirty-seven and one-half bushels. The value of the crop was over twenty-three and one half million dollars. A year or two previous the average yield per acre for Wisconsin corn was but little over thirty bushels per acre. The government reports for 1906 give the average yield of Wisconsin corn as forty-one and two-tenths bushels per acre and the average value as forty-one cents per bushel. The same authority gives the yield of corn for Illinois as thirty-seven and one-tenth bushels per acre. The yield of Illinois, the queen of the corn belt, is over five bushels less per acre than that of Wisconsin.

OUR WISCONSIN EXPERIMENT ASSOCIATION.

This Association of earnest Wisconsin farmers and students of our agricultural school has accomplished wonders already with the Wisconsin corn yield. Considering the acreage of corn for 1906 as approximately the same as for 1905, the gain in the value of the crop, due to the increased yield

per acre, is approximately two and one-fifth million dollars, and this is but a beginning The days of eighteen to twenty cent corn will never come again. The world has been educated to the uses of corn and the field of its use has outstripped production. We are but on the border land of the possible production of corn per acre. When Wisconsin farmers understand the value of seed selection, the proper care of the selected seed to insure unimpared vitality, the value of thorough preparation of the seed bed and the right kind of cultivation for the crop the average yield of Wisconsin corn can be nearly double what it is at present. We will then raise and finish more hogs. The beef cattle produced on the cheaper lands of the range country will seek our feed yards for fattening and finishing and the by products of the feeding will increase the richness of our soil and add to the value of our farm lands.

That the average yield of corn in the state can be raised to sixty or seventy bushels per acre is no dream. Many of the association members have already accomplished more than that. In 1905 the average yield of Wisconsin No. 7 (Silver King) corn, for one hundred and twenty members of this association reporting, was fifty-nine and two-tenths bushels of shelled corn per acre. The writer harvested in 1906, one hundred and seventy bushel baskets of ears per acre from two acres of Silver King corn planted and cared for as a seed corn plot, and one hundred and forty baskets per acre from twelve acres in another field.

Corn means money and fat bank accounts to Wisconsin farmers. The experiment association work is already showing wonderful results in corn improvement. Wisconsin must soon be admitted to the corn belt. Many of the farmers over there are already taking notice. Let us see if we cannot lift the average of the state a few more bushels per acre in 1907. We are in the lead and it should give us courage.

CURING SEED CORN.

O. R. FRAUENHEIM, RANDOM LAKE, SHEBOYGAN COUNTY.

In the following paper on curing seed corn, I will give some practical experience that will be of great value to the seed corn growers who wish to make a success of curing corn. By following closely what I say here some of the failures that have been made will not be repeated. I will write only of such things as have come under my observations the past few years.

Corn that is to be used for seed should not be harvested until fully matured. You will then have as much vitality in the seed as possible, to begin with. The corn should be picked as soon as fully matured and fire dried. This statement is given out by every experienced corn grower. How many farmers adhere to this rule? The seed corn is usually not gathered until husking time. If there is a hard early frost, like that of last fall, the vitality of the corn is knocked out and the result is that the farmers will have to buy their seed corn. I know of dozens of instances where this very same thing has happened the past year and yet the farmers are willing to do the same thing over again, saying that it is too much trouble to pick out the seed corn.

How much time is taken to pick out a few bushels of seed corn? It is not only a question of the time it takes, but each individual stalk can be studied from which the seed ears are taken. In this manner desirable characteristics can be bred into the corn.

The members of the Association, who grow corn for sale or intend to do so, may say that there is not money enough in selling seed corn, if this method is to be pursued. There is plenty of money in selecting seed corn in this manner. There is a larger profit in picking the seed corn as soon as ripe from the stalk, than in picking it at husking time when the vitality may be impaired by frost and the corn will not grow.

Corn that is frozen by a light frost before fully ripe is generally not impaired for seed, the corn should be left standing for some time in order that the grain may fill out. If cut as soon as frozen the fodder will be of a better quality but the seed will be chaffy and unfit for seed. When the ears are bet-

ter matured they can be picked and fire dried. I have cured excellent seed corn a number of times that was frozen in this manner.

During the past fall and winter I have traveled quite a bit through the state and always noted how the farmers take care of the seed corn. How often did I see corn intended for seed hanging under the eaves or on the sides of some building. This is the poorest method known in curing seed corn. If the corn grows at all after cured in this manner, it will be of such poor vitality the farmer will not realize a full crop.

After the seed corn is harvested, it should be placed in a room with a stove. Placing it on racks is the best method of curing same. If put in piles, some of the corn may mold. Have plenty of ventilation in the curing room, as a large amount of moisture will evaporate. It is best to keep up a fire for a week or longer Do not have the room warmer than 80 degrees to begin with, a little more heat will do no harm after the first few days.

A convenient, mouse proof curing rack is made by suspend ing the rack that is generally used, with bolts from the ceiling to within 18 or 20 inches from the floor. Mice are a great nuisance to the curing of seed corn This rack will remedy the evil and I suggest that every grower of seed corn in quantities that they give this rack a trial I believe I am the first one to make a rack of this kind and find it the best preventive for mice I have ever seen.

After the corn is thoroughly dry, care must be taken during the damp weather to have a little fire in the room in order to dispel the moisture in the air Otherwise the corn may absorb the moisture and may be injured by frost. I had a quantity of choice seed corn ruined in this manner the past winter, therefore I want to particularly warn every member of the Association to guard against the damp days during the winter. If you have only a small quantity of seed, you can keep it in the house where it will be safe from frost. But if you have a large amount of seed it must be kept in a warm and well ventilated room during damp weather.

If one intends to make a success in curing seed corn, the following rule should be strictly adhered to: "Vitality is preserved by thoroughly and quite rapidly drying the seed ears and storing them where they will not be exposed to damp atmospheres or sudden changes in temperature."

A GOOD ROTATION FOR THE CORN CROP OF WISCONSIN.

H. A. MAIN, FORT ATKINSON, JEFFERSON COUNTY.

Members and friends of the Association:

When planning a system of rotation we should have in mind some of the reasons why we rotate, principal of which are: 1st, to keep the elements of soil fertility in balance; 2d to more evenly divide the work of the year and 3rd, to assist in keeping fields free from weeds. Of course there are other reasons for rotating crops such as preventing work of injurious insects and loss by plant diseases, change of crops on a field and of decreasing the liability of losing an entire years work which often occurs under a single crop system; but these reasons are met by any system of rotation as we must plan our system with special reference to the three reasons first given and the relative values of different crops, and the system which best fills these requirements will be found the most practical.

Of course we all know that a good rotation for one farmer or section to follow, might not be a good rotation for another farmer or section to follow. There's an old saying that "What's one man's meat is another man's poison", and so it is with this. As Wisconsin is primarily a stock raising state, our crops should be selected and grown with the idea of feeding them to live stock and keeping the fertility on the farm. This, however, will be governed by such conditions as nearness to market and the cash value of the crop when put on the market as compared with other feeds, relative feeding values considered.

Some crops use more humus than they produce, as corn, potatoes and small grains. Some crops produce more than they use, such as clover and alfalfa, which also send roots deep and draw up elements of fertility. Hence to maintain sufficient humus in our soil we must bring in a grass crop often enough to balance up the loss of humus taken out by corn, potatoes or grain. How frequently we should do this depends a good deal on how well our soil will hold humus as sandy soil soon loses the humus, while heavy soils do not and might become sour. We must grow enough humus using crops to use up the

humus, and phosphorus, and potash as well, for fertility in soil is valuable only as we are able to make our crops take it out.

It is a good deal like a farmer who raises more corn to feed more hogs, to get more money to buy more land to raise more corn and so on. We should strive to get larger crops, to feed more stock, to have more manure to return to the land, to get still larger crops, etc

It is quite generally admitted that in most cases a three or four year rotation is preferable to a six or seven year rotation.

For a three year rotation corn, barley and then clover seems best. I prefer barley to oats because I think I can get more feed per acre and think it makes a better nurse crop. If you have no permanent pasture the clover can be pastured the second year thus making this a four year rotation, then manuring and plowing down for corn. I think some timothy sown with clover is advisable as it insures a better stand of hay. A better rotation still would be one in which alfalfa is used instead of clover. If I used alfalfa I think I should raise two cultivated crops in succession as two crops of corn or potatoes and corn, then barley, seeding alfalfa with the barley and cutting alfalfa two seasons This makes a five year rotation but it is most too expensive to plow up good alfalfa seeding one year old and take chances on your new seeding coming through in good shape.

Nor would I plow up all my alfalfa the same year. I should so arrange it that I only plowed up one-half of it. Then you would be less liable to have your entire crop killed out as you would have some which had been cut two seasons, some which had been cut only one year and some new seeding. Your acreage would be divided thus approximately—corn, two-fifths of your plow land, barley and new alfalfa seeding, one-fifth of land, year old alfalfa, one-fifth of land and two year old alfalfa occupying one-fifth of land. If for any reason the clover or alfalfa fails field peas and oats can be sown which will furnish a leguminous crop of hay and make out the rotation.

If it is desired to raise peas either for grain or canning, you can either substitute these for part or all of the barley, as the peas can be taken off and then alfalfa sown without a nurse crop. Some have obtained good results for using peas as a nurse crop for alfalfa.

The worst fault I find with peas in a rotation especially for canning purposes when they must be cut about a certain stage

is that the harvesting comes about the time when the first crop of alfalfa needs cutting and the young corn needs cultivating. Sometimes, however, the cash value of peas is large enough to offset this danger.

Any of these rotations comply pretty well with our principle reasons for rotating. Corn and potatoes being cultivated crops assist in keeping land clean, the alfalfa and clover keep land supplied with humus. The work of hauling the crops is pretty well distributed, all the different crops are valuable to feed to animals, and the feeding and care of the animals furnishes employment during the winter and keeps the fertility right on the farm.

Now whether any one of these proposed systems of rotation is the best for you on your farm must be settled by yourself. I hope I have said something which may assist each one in selecting a good rotation for himself to follow under his own special conditions.

PREPARATION OF THE GROUND FOR CORN AND SUBSEQUENT CULTIVATION.

M. J. SMITHWICK, KEWAUNEE, KEWAUNEE COUNTY.

There was a time when Wisconsin was way behind in the yield and quality of its corn, but I am glad to say that it is coming to the front in this line of agriculture. However, a whole lot remains yet to be done, and I think that by using more intelligent methods of cultivation, our yields can be be greatly increased. The average yield of Wisconsin of present is 41.2 bushels of shelled corn per acre. The yield of our Experiment Station is seventy-five bushels of shelled corn per acre. There is a difference of 33.8 bushels.

Any practical farmer should have his farm laid out in fields and a system of rotation practiced thereon. A system which is coming into general practice is the following: First year, small grain with clover and timothy; second year, clover; third, pasture or a crop of mixed hay; fourth year, corn.

By following a system of rotation similar to this, you raise a different crop on those fields every year, thereby not robbing

the soil of any certain element of plant food. It is well to manure your field at least once during this four year rotation. The best time is prior to raising the corn crop, or you can apply the manure immediately after removing the hay crop.

A word as to plowing; some advocate fall plowing while others advocate spring plowing. As for myself I prefer fall plowed land for the reason that the land will have the benefit of the frost action, and it will also be more firm. By late fall plowing you leave a large per cent of the cut worms and such corn enemies exposed to the frost, which will destroy nearly all of them.

As early in the spring as the land gets in shape to be worked, I would go at it with a good disk and work it good and deep. The object of this is to start the weeds to sprouting and at the same time aerate the soil. I would then wait a few days and put on the harrow, and work it crosswise to disking, and in a few days more give it another harrowing. Just before planting I would put the disk on once more and loosen up the soil and at the same time pulverize it. The disk is liable to leave the ground rough and it is well to pass over it once more with the harrow to be sure that your field is as level as possible. Without having your corn field smooth you cannot expect to get a good even stand of corn. After planting go on with a slant tooth harrow and give the field a good harrowing. If it rains after such harrowing, harrow again.

When your corn is check rowed I would not advise putting on the harrow after it is up for the harrow has no mercy for the delicate corn plants. Put your cultivator on as soon as your corn is up high enough to see to cultivate to advantage. A sulky cultivator is best for this work, as you can put shields on which will protect the corn. Try and give your field a good cultivation the first time, as you can get the cultivation quite deep without doing any damage to the roots. No fast rule can be laid down as to the number of cultivations and depth of same, but it must be borne in mind that when the corn is a few feet high the roots have spread out and cover the entire width of the row. These roots are only a few inches deep, generally depending upon the depth of planting, and moisture content of the soil. Now if you set your cultivator deep and cut off those roots which are working hard to produce the stalk, what are the results? The plant may not die but its growth is checked, and will remain so until the root system gets re-established. The plant has only a certain length

of time to grow, and if it loses a week its yield will be lessened. After the corn is too high to be cultivated with the sulky, it is sometimes well to cultivate lightly with a one horse cultivator. As a rule this one horse cultivation pays big wages. It must be borne in mind, however, that this system of cultivation will not apply to every farm, for circumstances alter cases.

SELECTING AND CURING SEED CORN.

W. A. TOOLE, BARABOO, SAUK COUNTY.

In the selection of corn for seed, some definite standard of the type of ear desired must be held in mind. This ideal should cover the form, size, color and shape of ear, and the size, shape and color of the kernel. Uniformity in shape and size of kernel is essential. For appearance sake the color of cob should also be considered. When possible the quality of fodder should be noted. Without some such ideal no progress can be made in improving or even maintaining the quality of the crop.

I have seen corn picked out by some farmers from which one might select half a dozen distinct types, and none of them good. Obviously no progress was being made by these farmers.

While for progressive work in improvement a general plan must be followed for several successive seasons, this ideal will change in many details every year, as the result of experience. No single type of ear will do for Wisconsin, or even for any one county, owing to varied soil and climatic conditions. For instance, in Sauk County a larger, later maturing variety may be grown on the richer, light soils than is at all safe on the heavy clay soils. While in localities subject to late and early frosts an extra early variety is necessary.

Many of the points, such as color of grain, indentation, etc., are merely matters of individual preference and affect the yield but little or not at all. These points are very useful nevertheless in indicating the progress made in improvement.

The length of season a variety requires to mature is of great importance throughout Wisconsin. A variety should be selected or bred, which will ripen in any season, yet will grow the full limit of time of the short seasons. Owing to the varied conditions the proper season will have to be decided from experience by each corn grower.

Some farmers prefer to select the seed after the corn is ripe, just before it is cut up. By this method they are able to pick those ears which are earliest in ripening and select from the most leafy stalks. A great deal of time must be spent in examining undesirable ears, before a sufficient amount of seed is found. There is always a tendency to be satisfied with undesirable ears, and there is also danger that too much importance will be given to earliness, with the result that the corn will deteriorate in size. If carefully dried where there is a good circulation of air this method will give strongly germinating seed.

Others select their corn from that left on the stalk without cutting the fodder The selecting is then done when husking, a basket or box being fastened in a handy place on the wagon, and desirable ears tossed into it. This method is very good if the husking is not left till winter sets in. The corn has an opportunity to thoroughly dry out with a circulation of air on all sides. As the fodder is much battered by this time, there will be but little chance to select from leafy stalks. But little practical improvement can be made by selecting for quality of fodder out of a large field, so this objection is of small importance.

As we need all our fodder for feeding purposes, we cut up our corn and select the seed from the shock at husking time. By either this or the previous method the earliness may be observed closely enough to select corn which will mature. Some examination of the size of stalk and quality of fodder may also be made. The husking should be done before there is much freezing weather, as the corn contains enough moisture at this time to be easily injured by a freeze.

There is still left the selection of corn from the crib, or "scoop shovel" method, as it is sometimes called. Unless the corn is well dried and cribbed before freezing weather commences, seed thus selected will be unsafe to plant. It is a poor method at the best, as there is little chance to pick out the good ears.

With any of these ways of selecting seed, several times as

much seed should be set aside as will be needed and a second, more careful selection then made. In the hurry of husking one cannot consider all details but must put aside all ears which appear superior in some respects.

I will not consider corn testing, as this subject will be treated by another speaker. I wish, though, to impress upon you the need of strong germination to secure a profitable crop, and that it is better to give extra care in selecting and curing the seed than to be forced to plant poor seed or buy at planting time.

In curing corn the chief dangers to be avoided are freezing, mouldiness, and sprouting. When the corn contains considerable moisture, light freezing will kill the germ. Dry corn will withstand considerable cold without perceptible injury. Storing corn in a warm room without ventilation will often cause it to mould or sprout. While fire dried corn is preferable if rightly managed, it must be remembered that a circulation of air is necessary to carry away the moisture released from the corn. Warmth without ventilation is unsafe.

While passing through the country one often sees corn traced and hung up to dry almost under the eaves, around the porch, or against the side of a building. Corn treated in this way will often dry in good shape, but it should not be left exposed after cold weather commences. The freezing would not be so harmful if it were not for the fact that the corn would absorb moisture at every storm, and as has been pointed out before, freezing dampness is fatal to corn. This way of drying corn will not secure the best results.

Another favorite method is to hang the corn in the kitchen. While the air of a kitchen is apt to be quite moist yet there si usually a circulation of air and this method usually proves satisfactory.

Most houses have some sort of garret and if there is some way of ventilating it, this is always a good place to dry the seed. The corn may be traced and hung over wires stretched across the room, or if mice are plentiful, we have found a frame work crib about 30 inches each way, covered over with wire mosquito netting, to be very satisfactory. The corn should be tumbled loosely into these cages so there will be a chance for a good circulation of air among the ears.

Gentle heat with ventilation is of great assistance in drying the seed. Heat without ventilation is very apt to result in injury to the corn. Corn should not be placed too near a stove

while drying, as moist corn is as easily injured by excessive heat as by freezing.

If considerable quantities of seed corn are to be dried, a separate room or building is needed. In this case the corn should be put to dry on frame work shelves made of 1in. x 2 in material of suitable length, using two pieces for each shelf. Not more than four or five layers should be piled on a shelf and an inch or two of space should be left between the top of the corn and the next shelf. If possible it is better to have the heat come in at the bottom of the room, pass up through the corn and out through ventilation at the top.

Sometimes corn is placed in the upper part of a corn crib or over other grain to dry. This is never safe, as grain is continually giving off moisture which passes upward with air currents, and the corn dries very slowly and may even absorb more moisture at times. It is never in proper condition to withstand freezing.

If decided improvement in the variety of corn is desired, selected ears should be planted by the ear-to-a-row method. Those not wishing to take the care and trouble necessary with this method will find that good results will be obtained if a number of the best ears are picked out and planted in a small field by themselvs or in a solid block in the main field. From this field, or part of a field, as much as possible of the seed for the main crop of the folowing year should be saved, setting aside some of the best ears for the following year's selected field. This process should be kept up from year to year.

TESTING AND PLANTING CORN.

GUY TRELEVEN, OMRO, WINNEBAGO COUNTY.

Few of the many thousand growers of corn realize the importance of properly testing their seed corn. When we stop and consider that a bushel of corn will plant from six to seven acres you see at once that a few poor ears in that bushel will give you a very uneven stand.

The importance of making what is known as an ear test was never so thoroughly impressed on my mind as it was two years ago when I secured eighteen ears of Silver King corn from the Experiment Station farm. From these eighteen ears I selected twelve which I called the best looking ones to plant by themselves in twelve separate rows. Upon making a test of these ears I found that two of the twelve would not germinate. I made a second test of these two with the same result Now, had I planted these ears without testing I would have had two rows with no corn. Two out of twelve or one-sixth. The question is, can we afford to plant corn when only five-sixths of it will grow or in other words, reap the benefit of only five-sixths of our land. I say we cannot.

At first thought it seems quite a task to make an ear test of say five or six bushels, but this can be done in two or three hours. Place the ears in rows on a long table or boards arranged for the purpose; then take a shallow box, say two inches deep, other dimensions according to amount to be tested. Place in the box about an inch of soil of a sandy loam, moisten with water and level off smooth; mark this off into spaces about an inch wide. Let each space in the box represent one row on the table. Now take out ear number one in row number one, as many kernels as you desire to test and place in space number one in the box with the tips of the kernels pointing in one direction; then take the same number of kernels from ear number two and place in the box with the tips of the kernels pointing in the opposite direction, and so on until you have each ear sampled. Press the kernels down firmly in the dirt and cover over with a piece of flannel well soaked in water; over this lay a newspaper or something to prevent evaporation Place the box in a warm place and in four or five days you can see the little shoots bursting forth from the

kernels; in about two days more the result of the test should be taken. If upon examination you find there are some kernels which did not germinate, go back to the end of the row and count up to see which ear they were taken from; if you find that they came from, say the twelfth ear, go to the row on the table and count up to the twelfth ear and lay that one out, and so on all through the test. I have tried several methods of testing seed corn but find this way the quickest and most satisfactory.

Planting is also a very important factor in the growing of corn. There are several methods of planting—namely, with the hoe, hand planter, drill or listing and with the check row. Of these I prefer the check row. For field corn I plant three feet, eight inches each way, four kernels to the hill. This can be done very accurately with the edge drop planter. Four kernels may be a little too thick on some land, but where the soil is in a high state of fertility, it will be found satisfactory.

VARIETIES OF CORN FOR WISCONSIN.

O. R. FRAUENHEIM, RANDOM LAKE, SHEBOYGAN COUNTY.

Fellow Members, Ladies and Gentlemen:

Very little effort had been made to establish standard varieties of corn in Wisconsin, when Prof. Moore took charge of the work several years ago. In many instances fairly fixed types have been established by growing one kind of corn for a period of years on the same farm without change of seed. The varieties are frequently designated by the name of the family by whom they have been grown. Clark's yellow dent is an example of a variety established in this manner.

As a general rule each farmer has his own variety of corn. In speaking of the variety, most farmers call it the "Yellow Dent" or "White Dent" corn. In looking over their corn cribs one may find something similiar to a yellow or white dent corn, but it is extremely difficult to find even a very limited number of ears of the same type. Nearly all are deficient in length, poorly filled tips and butts, and shallow and rounded kernels This corn is grown year after year, with

an occasional change from a neighbor, who has a variety of the same kind or worse. The result of planting these "mongrel" varieties of corn is the low average of less than 30 bu. per. acre for Wisconsin. While if proper care would be given in the selection of the seed, testing each individual ear and careful cultivation the average would be doubled

At present we have several good varieties of corn in Wisconsin. The Silver King or (Wis. No. 7) white dent, and the yellow dent (Wis. No. 8), may be placed at the head as they are tried more than any other varieties. While such varieties as the Clark's yellow dent, White Cap dent, Reid's yellow dent, and Leaming have done well in certain sections of the state.

The Silver King is the leading corn for the western and southern counties of the state. In 1905 it was grown by 275 members of the Association, in 21 counties of the state, with an average yield of 59.2 bushels per acre. Clark's yellow dent and White Cap dent have done very well in the southern counties, both ripen a few days later than the Silver King. The North Star yellow dent has done well in the central and western parts of the state.

The Wisconsin No. 8 the best of the early dents, is particularly adapted for the lake shore counties and the northern part of the state. During the past season it has been extensively tried in the eastern and northern parts of the state, maturing very early and yielding a good crop wherever grown. In Bayfield county, only a short distance from Lake Superior, this corn gave a yield of 47.7 bushels per acre and over 9 tons green fodder per acre.

I have observed that on certain soils, dent varieties do not do as well as the flint varieties, especially on hilly farms in our section of the state. On such soil such varieties as the White Flint, Mammoth Flint and Smut Nose will generally do well.

From the above list we have varieties for every section of the state. It is the duty of every member of this Association, not only to grow, but to breed up these varieties in order to improve them. Begin by taking the variety best suited for your locality, then test each individual ear in order to have each kernel planted produce a good strong plant, for experiments have proven that a kernel lacking in vitality, invariably produces a barren stalk. A barren stalk does just as much harm as a weed, so we want as few of them as possible.

Isolate your field under test from any other field of corn so that it will not be crossed. A great setback to the growing of pure bred corn is cross pollination from neighboring fields. To remedy this get the neighbors interested in the same variety. In many instances you will find that the neighbors are unwilling to invest a few dollars in good seed corn. Give these farmers some good seed and they will be the ones that will sing loudest in the praises for the corn, and help to disseminate the same, so that in a few years you will have the entire community growing the same variety of corn.

Let us all take hold of this movement of raising the average of Wisconsin corn per acre, by diseminating standard varieties of corn adapted for Wisconsin and thus grow two bushels of corn where but one grew before.

EXPERIMENT WITH SILVER KING CORN.

IKE BLOOD, MUKWONAGO, WAUKESHA COUNTY.

Mr. Chairman, Ladies and Fellow Members of the Wisconsin Experiment Association:

It gives me great pleasure to recall last year's experience in growing Silver King Corn. The seed was obtained from the Wisconsin Experiment Association, and planted on the 18th day of May, 1906. As the object of this experiment was to satisfy ourselves whether or not Silver King was a better variety for us to grow than yellow dent, an equal and fair test was carried on by planting the two varieties in the same field and giving each an equal amount of attention.

This experiment was carried out upon a clay loam soil which had produced clover and timothy the two preceding years. The sod was well manured, plowed early in the spring and rolled. Later this land was pulverized four times and dragged until it was in fine condition. After this it was rolled and the corn was planted (three or four kernels in a hill) with a check rower and followed with a fine tooth harrow; four days later the field was again dragged.

The corn was all up eight days after planting. The cultivator was started as soon as the corn was three inches tall

After each rain the field was cultivated both ways until the corn was too high to be cultivated with the sulky. The corn was hoed twice during the season, at the end of which few weeds could be seen.

Study room of Ike Blood, Mukwonago, winner of first prize on Wisconsin, No. 7 corn at the sixth annual meeting of the Experiment Association.

The yellow dent ripened about the first of September and Silver King came on ten days later, and was cut by hand the 20th of September. When dried thoroughly the two varieties were husked and we found that there was practically no difference in yield of ears, still the Silver King stover was a little longer and perhaps had a few more leaves.

There were few barren stalks and little smut in this field. Our seed corn was selected while husking. A comparison in the weight was determined by weighing several ears of the same size of the two varieties and it was found that the Silver King weighed an ounce to the ear more than the yellow dent.

At first thought this may not mean much. A little calculation shows that assuming 90 ears to the bushel, that is approximately 40 pounds of ear to the bushel, and a yield of 125 bushels to the acre, a difference of about 18.5 bushels per acre between the two varieties.

This coming season we expect to plant at least half Silver King corn. The only objection to growing Silver King entirely is the question of an early frost.

CO-OPERATIVE VARIETY TESTS OF CORN.

Silver King (Wisconsin No. 7).

H. A. MAIN, FORT ATKINSON, JEFFERSON COUNTY.

I secured seed from the Experiment Association in 1905 and harvested one hundred and twenty-five bushels of ears per acre and that from a rather poor stand. In 1906 I planted about eighteen acres of this corn. Part of this, about four acres, was on old alfalfa ground planted May 26th and was matured on September 15. The rest of the crop was planted on a light clay loam which had previously been in clover and timothy, but the timothy had pretty well taken possession of the land.. Part of this timothy had been top dressed in 1904. This was planted June 1st and ready to harvest the last of September. We husked 125 bushels of ears per acre from this and about 135 bushels of ears from what had been alfalfa sod. The fodder is very fine.

Silver King (Wisconsin No. 7).

H. L. POST. SEXTONVILLE, RICHLAND COUNTY.

My experience with Wisconsin No. 7 corn began with the spring of 1904. With the ten years of seed I received from the Experiment Association, I conducted a very careful ear test, with results showing a germinating test of ninety-eight per cent. The plot on which I planted my first crop was of dark sandy loam, having the previous year borne a crop of potatoes. After thoroughly preparing the ground planting was done on the 18th day of May, in check rows with a hand

planter, dropping two and three kernels in each hill. The crop grew nicely, being cultivated three times each way with a six shovel corn cultivator. On August 20th, I made a count and found only a small per cent of barren stalks. There being a frost on September 9th, I immediately cut and placed the corn in shocks to dry. When husking began I saved all I thought fit for seed, and also found a large amount of soft, immature corn, with long tips not well filled out. From my first year's trial crop I secured seed enough to plant about four acres, which I did the following spring on a fall plowed timothy and clover sod, which had been well disked and harrowed, and the planting done about the middle of May. No special cultivation or attention was given this field, only the customary method of field cultivation being followed.

The corn showed an earlier maturity than it did the first year and was cut and shocked before it was frosted. That year I found less soft corn and also better filled tips than the previous year. Last year I planted the Silver King corn on a spring plowed timothy sod and it was badly cut by grub worms, even until it reached the height of fifteen or sixteen inches, and therefore I received very poor results which were not the fault of the variety.

Taking my experience with Wisconsin No. 7 corn as a whole, I can say that I am more than pleased with the results I have obtained, and I think it is one of the best producing varieties we have in our section of the state.

Silver King (Wisconsin No. 7).

ELMORE A. BEULE, FOX LAKE, DODGE COUNTY.

I am glad to meet here today with you for the fourth time and relate what experience has taught me about Silver King corn. To those of us who live south of the central part of our state, corn is the crop of all crops that we should give special attention. It will always return large profits for a little extra care given it. Few farmers today are willing to pay what a bushel of good seed corn is really worth to them. They do not comprehend its importance.

I was glad to hear Mr. Marshall's paper yesterday on the importance of this crop. He certainly did not overdraw it.

Different sections of our state naturally require different varieties of corn according to the conditions that exist. In my experience in retailing seeds, corn has always been the hardest seed or grain to give satisfaction and still our farmers are only half particular enough in selecting and keeping their seed corn even when they have the proper variety for their conditions.

The past two years experience with Silver King rather convinces me that that is the proper variety for us up in Dodge county. Surely for silage it can not be beat. Its long, heavy ears and the numerous leaves on each stalk make it ideal for that purpose, and for fodder. Many of the stalks bear two fully developed ears.

The eighteen acres of Silver King we had this year yielded sixty-one bushels measured in the cribs and sixty-five bushels per acre as our yield the preceding year, allowing two bushels of ears to make one bushel of shelled corn. Our seed germinated ninety-eight per cent, and was planted in a rich black loam, that drifted into clay in one part of the field. Oats had preceded the corn and the field was spring plowed The corn germinated evenly and everything seemed to boom from the start.

The field was cultivated five times with the ordinary sulky cultivators, but a sixth cultivation, which would have kept out the weeds was impossible as we had other urgent matters to attend to.

If we could have fed the corn what the weeds took from the soil, I am sure we would have exceeded our best previous yield. The corn had been checked in three or four kernels to the hill and hardly a barren stalk could be found, but many bore two good ears. I shall plant more Silver King corn next year than heretofore and with favorable conditions, I expect to reach a yield of seventy bushels next year.

Silver King (Wisconsin No. 7).

PAUL J. BAST, ROCKFIELD, WASHINGTON COUNTY.

Fellow Members of the Wisconsin Experiment Association:

I take pleasure in reporting to you the results of my experiment with Silver King corn this past year.

The seed for this experiment I received from the Experiment Association. The soil on which it was planted was a clay loam with clay sub-soil. This plot was manured in spring at the rate of about ten tons to the acre and was plowed shortly before planting. Just before planting it was worked thoroughly with the disk harrow and then packed down with the roller, and dragged.

The corn was planted May 22nd. It was planted according to the check row system, at the rate of three kernels to the hill, the hills being three feet four inches apart. Immediately after planting the plot was dragged with a fine tooth harrow. This was repeated about five days later when the corn was just coming up. After that it was worked with the cultivator about once every week or ten days until the crop became too large to permit such operation. It was hoed three times and the field when the corn was harvested was pretty clean from weeds or grass.

The crop was very thrifty and was always somewhat ahead of other varieties. When it reached the stage of maturity, it stood from eight to eleven feet tall and practically every stalk bore a good sized, heavy ear of corn and many two. The number of barren stalks was limited to about two per cent.

The crop was cut at the end of September, and at that time was fully ripe. This plot which was just one acre yielded one hundred and eighty bushels of ear corn by measure. In order to get a closer estimation as to how much shelled corn there would be, I dried ten bushels of ears, and after they were fairly dried, shelled them and received from these ten bushels of ears five and one-third bushels of shelled corn. At this rate the one hundred and eighty bushels of ears would equal ninety-six bushels of shelled corn. This is twenty to twenty-five bushels more per acre than we received from a yellow dent variety grown under the same conditions.

As far as the stalk of this No. 7 corn is concerned, I think it is considerably superior to that of other varieties, as it grows

to a larger size and developes more and larger leaves than other varieties and consequently furnishes a larger amount and a more nutritious feed in the form of silage, fodder or stover.

I am well pleased with the No. 7 corn and we expect to plant no other but No. 7 on our farm next season.

Silver King (Wisconsin No. 7).

FRED P. GREBE, FOX LAKE, DODGE COUNTY.

Members of the Association and Friends:

My experience with Silver King corn the past three seasons has been encouraging. In the spring of 1904 I received ten ears of the corn from Prof. Moore of the Experiment Station to carry on my experiment, and the seed upon test gave a germination of ninety-seven per cent. I did not plant it as early as I would have liked, because there was not a suitable place separate from our common variety to plant it, and had to wait a few days until after I had our common corn planted. We got our potato land ready and planted the corn on one side of it, about May 20th, with a hand planter in hills eighteen inches apart and two seeds in each hill, the rows being three feet eight inches apart. The corn was fairly well matured October 3rd, when it was cut and put in shocks. I made an estimate of the yield of about sixty-seven and one-half bushels per acre, which gave me courage enough to plant seven acres of this corn in the spring of 1905. This spring I used a checkrow horse planter, planted it three feet eight inches apart both ways, had a stand of about three stalks to a hill. The corn was planted May 15th, harvested September 28th, and gave a yield of seventy bushels per acre of well matured corn. I sold considerable of the seed to my neighbors before it was cut, as most everyone thought it was a corn that gave a very large yield, and would ask whenever they would see anyone around, "Say, what kind of corn is that down along that fence?" We all were much pleased to inform them.

Last spring I planted twelve acres of this corn of the best seed I could select from the previous year's crop, this was also

planted with a checkrow planter in hills the same as the year before, planted and harvested about the same time, and gave a yield of seventy-three bushels of well matured corn per acre. In the feeding value of the stalks I must say that I do not know of any variety that has such a great amount of leaf in proportion to stalk as the Siver King.

The soil where this corn has been growing is of a rich clay loam, with a clay sub-soil. The soil was thoroughly worked all the time and kept clean from all foul stuff.

From my knowledge of varieties of corn that are grown in Wisconsin, I do not know of any that will give as large per cent of the shelled corn as the Silver King, except it be the Clark's yellow dent, which also has a deep kernel and a small cob.

This experiment proves that we can raise Silver King corn in Wisconsin.

I believe that if the farmer of today would be more particular in selecting his seed corn and use only seed that has been tested and not run any chances in planting his corn, thinking it will grow, that the average corn yield of Wisconsin would be greatly increased. Absolute rules for the time of planting for all sections of the country are obviously impossible. However, there is a time every season which is favorable for planting. It is the business of the farmer to have the seed bed prepared in order to take advantage of this propitious time.

Of course we do not want any frost from the time of plant ing until the corn is harvested, though along the line of weather we cannot have always what we want. But I would rather have my corn frosted a little in the spring than in the fall. For this reason, it sprouts out again and under favorable conditions the corn will still mature, while if frozen in the fall the crop will be destroyed. Always remember that its the "early bird that catches the worm".

Silver King (Wis. No. 7.)

J. D. BECHTOLT, MONROE, GREEN COUNTY.

My experience with the No. 7 corn began last spring and in my opinion was successful. The seed which I received from the Association gave a germinating test of one hundred per cent. The soil chosen for the experiment was a heavy loam cropped the previous two years with medium red clover. Owing to the fact that the soil was free from weeds, it was not put through a weed killing process, but was prepared in the following manner. It was spring plowed and well worked up followed in a few days with a check-row planter dropping three kernels to the hill, 3 ft. 6 in. x 3 ft. 8 in. apart. The corn was harrowed twice before it had time to come up and when it did appear it came evenly.

During the growing period it was cultivated four times and partly hoed. It grew rapidly and by the 10th of September, it was ready to cut, but owing to the fact that it was wanted for seed it was allowed to get entirely ripe. When it was husked I was much surprised to find that I had over five bushels more per acre of Silver King than our best other variety, there being a yield of seventy-two bushels of shelled corn per acre. The fodder would have been fine for there was a high percentage of leaves to the stalk. The corn was quite uniform, being free from "nubbins".

I found that there was about four per cent of barren stalks. The smut was less than one per cent, there being only a trace.

I think this corn will become popular on account of its leafy stalk which makes it good for both silage and fodder. The ears being uniform in size make it preferable to many other varieties for husking by machinery. It is a medium early variety and yet a good yielder. We are going to make it our main corn crop in the future.

Silver King (Wisconsin No. 7).

C. F. SPAULDING, OCONOMOWOC, WAUKESHA COUNTY.

With this subject upon which I am requested to speak my experience has so far been quite favorable. The field on which I planted this variety of corn contained about four acres. . Part of it has been planted to corn for the past twenty years, while the other part has been in orchard, garden and grain but no hay crop has been grown within that time and every year the field has received a coat of stable manure. The surface is uneven with pockets in it, having no outlet. The soil is clay loam.

The field was plowed May 19th to 23rd, then dragged twice and rolled three times alternately from May 23rd to 26th. Planted on May 26th using seventy-five pounds of seed hand-checked, dropping four to five kernels in a hill, hills eighteen inches apart in rows, thirty-nine inches apart. The first cultivation was June 11th, the corn being two inches tall. It was cultivated twice one way and five times the other way from June 11th to July 24th.

On account of drought and unevenness of soil in elevation and fertility the corn was backward and uneven in growth and maturity, while some of it dried up before maturing. I husked some corn from standing stalks on Sept. 19th and 20th. Amount of corn husked off, 125 baskets. About ninety-seven per cent of stalks had fair sized ears. The field having been previously infested with smut there was a small per cent of smut but not as much as expected.

Taking everything into consideration I think Silver King corn is a good yielder in size and uniformity of stalk and ear. The ears are well filled from tip to butt. Either for silage or grain I consider it a profitable variety, with only a slight objection in its late maturing, which will be overcome by becoming acclimated. The yield is very good from all appearances. The silage of this variety which I am at present feeding is fine, being sweet and with a clear, fresh appearance. The stock eat every bit of it.

Silver King (Wisconsin No. 7.)

W. S. MARSHALL, DELTON, SAUK COUNTY.

I planted two measured acres for the purpose of raising seed the season of 1906. The land selected for the purpose had been under cultivation for forty-five years. Soil, a dark brown loam with clay subsoil. Cropped to corn 1904 and 1905. Manure applied 1906, twelve fifty bushel loads of well rotted barnyard manure per acre, three hundred pounds steam ground bone and fifty pounds muriate of potash per acre added as top dressing before plowing. Plowed eight and one-half inches ... depth April 25th. Thoroughly worked and pulverized, using Acme harrow and tooth harrow directly after plowing. Harrowed and pulverized again May 13th. Marked off in checks 3 ft. 8in. by 3 ft. 8in. May 14th. Each row contained one thirty-sixth of an acre, seventy-two rows in all. The seed, seventy-two best ears, selected from two hundred pounds of ears purchased from H. A. Main, of Fort Atkinson. Of the seventy-two ears thirty-six were rather smooth, not roughly indented, the other thirty-six were of rougher dented kernels. Row No. 1 was planted from a smoothly dented ear, No. 2, from a roughly dented ear, and so on until the whole seventy-two rows were planted. Each row was planted from the center kernels of a single ear. All was hand planted, four kernels to each hill. Planted 15th May. Land thoroughly worked over using spring tooth weeder May 22nd, and again, using harrow, about five days after. Frost the last of May cut plants to the ground. Was thoroughly cultivated at intervals of about eight days until too high to pass under the cultivator arch, after that once each way with one horse cultivator. As soon as corn began to tassel the even numbered rows (those planted from the rougher dented corn) were detasseled, the tassels being pulled off each day as they grew long enough to be reached until all the stalks had been detasseled. Every barren stalk in the tasseled row was cut out. Corn was fully ripened by the 7th of September. Was husked out in October. Resulting crop was even in indentations, showing a medium between the smooth and the rough ears, much more even in appearance than the the seed purchased from Mr. Main. Total yield of the two acres was three hundred and forty and one-half heaping bushel baskets of ears. Average weight of basket was forty-two pounds. Estimated yield of shelled corn per acre, one hundred bushels

YELLOW DENT CORN.—WIS. NO. 8.

O. R. FRAUENHEIM, RANDOM LAKE, SHEBOYGAN COUNTY.

My experiments with this corn began in 1905, when I carried on an ear test on a small plot. The result of the first year's work demonstrated that it was well suited to my locality. Therefore we planted our entire crop with this variety the past season.

The field in which it was planted had grown barley the previous year. It was well manured during the winter and plowed in the spring. The land was well disked and harrowed until a fine seed bed was secured. The corn was planted in drills about May 2. The cultivator was put to work as soon as the corn appeared above the ground, beginning with narrow shovels on the cultivator and finishing with horseshoes, throwing the ground into the rows when the last cultivation was made. The object at all times was to keep up a soil mulch. The corn was fully matured Sept. 12, when it was cut with a harvester and put in shocks. It was husked with a machine, when well cured. It yielded at the rate of three double wagon boxes to the acre or about 75 bushels shelled corn per acre. This is the largest yield ever made in my neighborhood. I attribute my success with the corn not only to the fact that it is good yielding, variety, but to the careful selection of the seed, the testing of each individual ear and good cultivation. Every ear that did not show strong germination qualities was discarded so that every kernel planted produced a good strong stalk.

The product of the best yielding row grown the previous year was planted on one side of the field. The results proved that like produces like in corn as well as in livestock. The yield was far greater on this part of the field and there were more and better seed ears.

The Wisconsin No. 8 corn grows to a height of seven and eight feet, has a stalk of sufficient length to withstand storms that generally cause corn to go down just before ripening. It has plenty of leaves, therefore is an excellent corn for fodder. It is a good yielder as the results of two years have proven. Its early maturing qualities make it an ideal corn for the lake-shore counties and northern Wisconsin.

WISCONSIN NO. 8 CORN IN THE SUPERIOR REGION.

E. J. DELWICHE, SUPT. SUB-STATION FARMS, IRON RIVER, BAYFIELD COUNTY.

Until within a few years the common opinion had it that corn could not be successfully grown in northern Wisconsin. Many people knew of this region as the natural home of the clovers and grasses, but it was not believed that corn, especially the dent breed could be successfully raised there. However, some of the most progressive farmers in the north central counties did raise corn, some with good success. But whether or not dent corn can be ripened almost within sight of Lake Superior, is a question that the average farmer is disposed to answer in the negative. It is true that corn of the flint varieties is raised here and there in this region; this however, is not true of dent varieties. Now corn is just the thing that is needed to make a balanced ration for the dairy cow, when fed in combination with the clovers that grow so luxuriantly in the Superior region. Hence, it seems proper that some effort be put forth to introduce a variety of corn that not only will furnish abundant material for silage and fodder, but such as will also yield a good quantity of grain per acre. It was with such thoughts in mind, that, in the sprng of 1906, when work was begun at the Iron river sub-station, dent corn was included on the list of crops under test. Wisconsin No. 8, dent corn, on account of its early ripening qualities was the variety tried.

The soil on which the corn was planted is a sandy loam, a type very commonly found within a distance of twelve to eighteen miles from the lake shore The field had been in small grain in 1905 and was seeded down to clover of which there was a fine catch. Early in spring the land was given a light dressing of barn-yard manure.

The clover grew rapidly, until turned under the latter part of May. The land was well worked with the disk after being plowed, and the corn planted June 3rd. The corn came up well and was a perfect stand. Clean but shallow cultivation was practiced throughout the season, an effort being made to get a dust mulch after every heavy rain. The corn was laid

by about the last of July. Although, the month of July was exceptional for this section, the corn kept on growing without a check. By the last of August the corn was well in the dough and stood almost ten feet tall. It was harvested in the latter part of September, yielding 47.7 bushels of shelled corn per acre. The total weight of the uncured corn was nearly ten tons per acre. These yields would not be considered exceptionally large if compared with those of the best corn raising sections, but it must be remembered that the seed from which this crop was raised grew more than three hundred miles south of where it was planted. Then too, no special effort was made in the matter of fertilization. Everything considered the prospects of raising this dent corn on the best sandy loams of the Superior regions are very bright. By exercising proper care in the selection of seed, the preparation of the soil and right after culture, it seems that Wisconsin No. 8 corn is destined to become the corn of this section. It certainly is bound to rank as a valuable acquisition for the farmer of northern Wisconsin.

YELLOW DENT CORN (WIS. NO. 8).

O. J. KROGSTAD, EAU CLAIRE, EAU CLAIRE COUNTY.

Fellow Members of the Association:

We received from the Experiment Association last spring twenty medium sized ears of this corn, which we planted in a heavy clay with shell rock sub-soil.

The year before potatoes had been planted on this land, and it had been plowed that fall. The following spring the land was disked and harrowed twice and on May 9th the corn was planted with a hand planter. Three kernels were put in the hill, and the hills three feet apart. The field was cultivated five times with a spring tooth cultivator and about Oct. 1st the corn was cut and shocked. It was left in the shock almost one month before it was husked.

These twenty ears, planted on one acre yielded sixty (60) bushels of good sound corn and about two tons of fodder.

CO-OPERATIVE TESTS WITH ALFALFA

PHIL T. BIXBY, APPLETON, OUTAGAMIE COUNTY.

The merits and value of the alfalfa for Wisconsin dairy farmers have been so thoroughly impressed and proven by Prof. Moore, Hon. W. D. Hoard, and many of the members of the Wisconsin Agricultural Experiment Association, that I shall not endeavor to discuss it further.

The experiments carried on by this association the past three years have been to determine the relative merits of varieties. the proper and most successful means of seeding, and harvesting, and the necessity of inoculation of the soil.

My experiments have been limited to two seasons trials, 1904 and 1905. In the spring of 1904 I planted on a half acre of rich sandy loam 5 pounds each of Turkestan and American alfalfa seed secured from Prof. Moore. Two pecks of oats were used as a nurse crop. The alfalfa of both varieties came up strong and even as did also the oats. which lodged badly and continued wet weather prevented cutting. When finally the oats were removed many alfalfa plants had been smothered. Those that remained made a fair growth before winter. The following spring I was surprised to note the plot where Turkestan seed was used was almost bare, while beside it the American variety was growing thick and strong.

The American variety proving the better in this and many other reports of experiments, I sowed an acre of that using twenty pounds of seed, on the twentieth of April, 1905. This seed germinated well and made an excellent stand. Oats were again used as a nurse crop, but were cut about the tenth of July, for hay, and excellent hay it made for the alfalfa had made a growth of eighteen to twenty inches and cured well with the oats. About the 30th of August, the alfalfa had made a rank growth and much was in bloom. I made a mistake in cutting it at this time, though the acre yielded nearly two tons of well cured hay, it did not make sufficient subsequent growth for winter protection.. Much damage was wrought by the open weather and ice of the winter of 1905 and 1906, and my alfalfa suffered with most of the other seedings of clover and grass in our neighborhood

Examining roots for nodules I found some on plants on

land which had been inoculated with soil, and fully as many on land which had not. Sweet clover is common along the road way in this neighborhood and I believe nodules will develop naturally.

These experiments have proven to me that alfalfa can be successfully grown in Outagamie county, and with the experience gained and the advice of successful growers, I hope soon to see it established as a permanent crop.

ALFALFA.

W. S. MARSHALL, DELTON, SAUK COUNTY.

Amount seeded, three and one-half acres. Soil, a sandy loam with marl subsoil shaded off to gravel and sand at the depth of four feet. Land has been under cultivation for fifty years, the last five in pasture grass upon which cattle and hogs were pastured.

Three hundred pounds per acre of steam ground bone and fifty pounds per acre of muriate of potash were used as top dressing before plowing. Sod turned over early in April, well harrowed and pulverized directly after plowing. Seeded May 8th, using twenty pounds per acre of fresh No. 1 seed purchased in western Kansas. Five wagon loads of earth from a roadside sweet clover patch were used for purpose of inoculation. Five hundred pounds per acre of fine ground limestone were evenly drilled in and harrowed well before seed was sown. Seed sown broadcast with wheelbarrow seeder. Ground harrowed over once with spring tooth weeder, then rolled, completed the seeding. Result, a good stand. Plants twelve to fourteen inches in heigth at seven weeks, with tap roots twelve to sixteen inches in length. At this age most of the plants showed bacteria nodules on roots. Plants well in bloom July 26th but very weedy. Plot was mowed and the crop of weeds and alfalfa removed from the ground. About ten square rods near center of field were eaten out by grubs and will have to be re-seeded in the spring. Other than this the field was covered with a good growth of alfalfa plants when fall came. A careful examination of the plants in different

parts of the field showed practically every root well stocked with bacteria nodules, proving that the sweet clover inoculation was a complete success. I have had long experience with alfalfa in Texas and have never seen a plot of alfalfa showing a more perfect inoculation than did this field. This plot was grown without a nurse crop.

ALFALFA.

WM. F. RENK, SUN PRAIRIE, DANE COUNTY.

Our experience with alfalfa is rather limited. We sowed a small patch two years ago last spring, about a three-quarters of an acre, one half was sown to American grown seed and the other half to Turkestan alfalfa. There never was at any time any noticeable difference in the two patches, both in production of hay and in vigor of growth. There also was no difference in the wintering qualities of the two varieties. About the time the grain, which was sown as a nurse crop, was six inches high there appeared a weed on the patch where the Turkestan alfalfa was sown, somewhat resembling wild mustard. We do not know to what extent these weeds are noxious, as we pulled them up promptly by the roots as soon as they were several inches above ground. The alfalfa on both plots showed a vigorous growth the first season after sowing, but rusted quite badly in midsummer and was then promptly cut and then threw up a new growth of vigorous leaves.

The two patches gave two cuttings and about one half of the piece yielded three cuttings of hay the first season after sowing, but upon examination of the roots it was found that but few nodules were on the roots, which probably accounts for a somewhat light crop of hay. This absence of nodules was the same in both patches, neither of them showing but few.

The second year the alfalfa patches yielded three cuttings of hay but Kentucky blue grass and white clover began to come through seriously choking the alfalfa in some places.

The plants seemed to survive the winter well, and if it were not for the blue grass and white clover running in, would be a nice stand.

I think it is a good plan in seeding a patch of alfalfa to select a piece of ground that is comparatively free from blue-grass and white clover, as they are bound to come through the alfalfa and choke it out in time.

In conclusion I would say, use American grown seed because it is cheaper and just as good as Turkestan, sowing on a well fertilized piece of ground, free from the grasses which I have mentioned and inoculate the ground with dirt secured from a patch that has previously grown alfalfa.

ALFALFA.

C. E. FISHER, EVANSVILLE, ROCK COUNTY.

I always like to listen to the experience of others, so I will in a *brief* way tell of my experience with alfalfa in Rock county.

In the spring of 1906, I secured enough seed from the Experiment Association to sow one-half acre. When the Short Course closed and I returned to my home. my father and I decided to try an experiment on five acres of well drained soil. We purchased the rest of our seed from a local seedsman. The seed was tested and gave good results, each test averaging between ninety-eight and one hundred per cent.

The field was plowed in the spring and dragged and rolled three times. On the twenty-seventh of April we sowed the alfalfa seed at the rate of eighteen pounds per acre. As a nurse crop we sowed three pecks of barley per acre. The thorough preparation of the seed bed taught us a valuable lesson in fitting the ground previous to sowing or planting any seeds. The barley and alfalfa were put beside a field of barley, sown several days before the alfalfa and barley for experiment. The barley sown as a nurse crop germinated and appeared above ground before the crop sown on the ground that was not so well prepared before sowing the barley. We cut the nurse crop as soon as it was ripe enough to secure good grain. The barley was set up in small shocks and stacked as soon as it was dry enough. As the shocks were left in the field only a short time we did not find many of the alfalfa plants killed,

where the shocks stood. When I left home in December to complete the Short Course we had a promising stand of alfalfa.

We did not inoculate the soil as sweet clover grows in abundance along the roadsides.

ALFALFA.

ALBERT EINFELDT, GREENWOOD, CLARK COUNTY.

Mr, President, Fellow Members of the Experiment Association:

My experience with alfalfa dates back three years to the time my brother took the Farmer's Course and incidentally contracted the alfalfa fever from Professor Moore, consequently in the following spring we seeded two and one-half acres of land to alfalfa (Turkestan) using wheat as a nurse crop at the rate of one bushel per acre. The land is high and rolling enough to drain well, it is a clay loam with clay subsoil. The alfalfa made a good start, but owing to lack of proper bacteria it died out quite extensively in the latter part of the season, but desiring to see the outcome we left it as it was and although the next year we harvested a good crop of hay still over one half of it was clover. This field was broken up that fall and last spring seeded again in the same way, using twenty pounds of American alfalfa seed per acre. A part of the field I inoculated with some soil shipped me from the Experiment Station farm, and seemingly the alfalfa was a little better there than in other parts of the field, but this may be attributed to the influence of the nurse crop, as it was somewhat lighter on that place. The alfalfa now is a good stand over the whole field with well developed nodules on the roots, and we are expecting great things from that small piece of land. We hope to demonstrate that alfalfa can be successfully grown in the best dairy country of the world, northern Wisconsin.

ALFALFA.

J. D. BECHTOLT, MONROE, GREEN COUNTY.

Members of the Association, Ladies and Gentlemen:—

I will in a brief way relate my experience in the growing of alfalfa. This is an important crop and is going to continue to grow in importance as the land rises in value and farming becomes more intense. A large yield of protein can be taken from the land without taking out the fertilizing constituents to any great extent. Being a legume it adds great quantities of available nitrogen to the soil.

The first alfalfa which we grew in Wisconsin was in 1903. This was a small patch about ½ acre. The soil was well prepared and sown at the rate of twenty pounds of seed to the acre without a nurse crop. This did well, but the weeds gave us some bother and we have come to the conclusion that it is much better to sow with a nurse crop, barley being preferable. The soil was not artifically inoculated for the reason that sweet clover grows wild everywhere it is given a chance. I may say that this original patch has not been plowed under to date, but we are going to this coming spring.

The seed which I received from the Association last year gave a germinating test of ninety-seven per cent. It was sown on a dark sandy loam. It is well drained and lies toward the south. This land was not inoculated as the land was previously cropped with alfalfa. The soil was spring plowed and well worked up followed by a ho drill, sowing 1-½ bushels of barley to the acre as a nurse crop. This was followed by a heavy flood and then eighteen pounds of alfalfa seed was sown to the acre. A final harrowing finished the work of sowing. The work of sowing was done as early as possible being the 10th of April. The nurse crop was allowed to ripen and a good yield resulted. After the nurse crop was removed the alfalfe made a vigorous growth, but another factor entered the game at this point which was weeds and plenty of them.

I allowed the alfalfa and weeds to grow together till the last part of August when I ran over the land with a mower and clipped it all off, leaving the proceeds on the soil to wilt down and conserve moisture. After this the alfalfa made a rapid growth and when winter set in there was several inches growth

to act as a cover crop. We have always used the American variety, and know nothing about the Turkestan.

We learned a valuable lesson from this field and that is that it is useless to try to grow alfalfa on land that is low in fertility One end of this field has a poor spot in it and the result is that alfalfa is weak and thin there.

To grow alfalfa most successfully we must duplicate as near as possible, the conditions which exist in the west. Out west they have mild winters and well drained rich land. We cannot duplicate their winters, but we can furnish the plants a cover to protect them from the cold.

RAPID STRIDES MADE IN BARLEY CULTURE—BARLEY CENTERS TO BE ESTABLISHED.

R. A. MOORE.

The Wisconsin Experiment Station has been putting forth especial efforts in the way of improving the barley crop New varieties of barley have been bred to take the place of many of the mixed varieties now in use. The improved Manshury and Oderbrucker barleys are rapidly replacing the old mixed barleys of the state and are giving yields varying from five to ten bushels more per acre. Pedigreed varieties of barley have been bred at the Station farm, which give great promise and as soon as these varieties can be grown in large quantities, they will be disseminated throughout the state.

We feel at the present time that great barley centers should be established in various counties of the state where farmers in whole townships will grow just one selected breed of barley. This will enable maltsters and other purchasers of barley to get one even uniform grade.

Dr. David Fairchild of the United States Department of Agriculture is now co-operating with the Experiment Station in the breeding and dissemination of good brewing barleys and we look for much improvement over the barleys now grown for this purpose.

CO-OPERATIVE WORK WITH THE U. S. DEPT. OF AGRICULTURE WITH BREWING BARLEYS.

C. P. NORGORD, SPECIAL AGENT, MADISON, DANE COUNTY.

The barley of the barley markets and barley raising areas of the United States are in a singular chaotic and mixed condition. Not a single pure race of barley is in general cultivation today.

The terms Manchuria, Scotch, Oderbrucker and Chevalier though some of them representing comparatively good yielders are nevertheless but mixtures of several distinct botanical varieties or races which differ more or less from each other in their yield, maturing, malting and brewing qualities.

At the first glance this does not appeal to the farmer as affecting him seriously. He applies the old argument which has kept the scrub cow so long on our farms and advocates leaving it alone. Looked at in its relation to the market and the maltster who sets the standards for the market, the question appears much more serious. It is found that each variety in the mixture has its own period of germination, one kernel requiring four days to develop as far as the maltster requires while another requires eight days. At whatever time the maltster discontinues the germination he will have a part of his malt either germinating too far or not far enough. In either case, there is a serious loss of the valuable qualities sought for in the barley. Molds, bad flavor and innumerable other serious evils also follow upon the condition. The general markets have shown within the last few years that this mixture and degenerated condition of barleys is increasing rather than decreasing, despite the efforts which have been made by a few of our agricultural colleges.

There is therefore, ample room for a better barley on our markets and a very definite demand backed by a liberal price has arisen for an improved barley. As an instance of this, it may be cited that the last few years the Pabst Brewing Co., of Milwaukee has paid seventy cents for a superior barley obtained from Montana while the highest market price for common barley has been fifty cents per bushel.

It is the purpose in the co-operative work between the Department of Agriculture and the Wisconsin Experiment Sta-

tion to obtain and place in the hands of the farmers of the barley areas of the United States and Wisconsin in particular, a barley which will command this high price in the markets of the United States. Not only is there a need of bettering the products going into our own markets, but also those going into European markets. According to consular reports, our barleys are demanding a price far below the market price of the best Bavarian and Bohemian barleys in Europe. The cost of freight per bushel from New York to Hamburg, Germany, is only about nine cents while the prices paid for good malting barley in Bavaria are twenty to forty cents per bushel higher than those in America. Recent laws in England requiring the use of pure malt is opening that market to a good quality of barley. It is, therefore, time for us to better ourselves and place on these markets a barley which will have a reputation and will capture and hold these markets for us.

The utter annihilation of the barley industry on the small farms in the east by the great level, fertile grain areas of the west where the use of improved machinery is possible, indicate to us the possibility, almost certainty, that given an equally good variety of grain these same grain areas can successfully compete with the small farms of Europe with their primitive methods even with the necessary disadvantage of transportation.

It is for us to find the evils with our present barleys and remedy them.

Reports from Europe agree with the same from maltsters and brewers in America regarding the lack of uniformity in germination and other evils consequent upon the serious mixture of our present barleys. We believe, therefore, that the remedy lies in the introduction of pure races of superior brewing barleys into the barley areas of the United States.

We propose, therefore, to attack the problem by the following lines of work:

1. The importation of pure races of barley.
2. The breeding of pure races of barley.
3. The testing of pure races of barley for yield and malting.
4. The establishment of large barley centers for each variety.
5. Dissemination of information on culture and care.

By pure races of pedigreed barley we mean such as originated from a single seed and has passed through a rigorous course

of selection. We propose to carry on our breeding work here at this station, along two definite lines; first, by line breeding, and second, by hybridization. The process of line breeding which we intend to carry out is that first carried out in this country by Prof. W. M. Hays, Asst. Secretary of Agriculture, while he was Agronomist at the Minnesota Station. It consists of growing the progeny of a single seed, and weeding out carefully each year the poorer plants while the strongest and most desirable plants are retained. Thus within five or six years sufficient seed of a superior quality can be secured to sow one-twentieth of an acre.

The process of hybridization consists in fertilizing one flower with pollen from another thus by selecting two plants which have each desirable qualities we are able to combine the two and produce a stronger and more desirable progeny.

We propose thus to work toward the ideal of securing after a few years some desirable variety.

Professor Moore has been at work the past six years and, as a result has now the only pedigree barleys produced in the state. During these years he has been steadily but quietly working and has now sufficient pedigreed seed of four varieties to sow one-tenth acre of each the coming summer. These varieties are Oderbrucker, Manchuria, Golden Queen and Silver King. These quantities are somewhat small as yet when we consider stocking the whole United States or even the state of Wisconsin with them, and the prospect of accomplishing the same with varieties still to be produced is still farther in the distance.

We have, however, learned of a great work which has been done in Sweden by Dr. Atterberg and his successor Dr. Hjalmar Nilson of Svalöf, Sweden. These men have now available and in circulation in Sweden a number of choice varieties of pedigreed barleys. The United States Department of Agriculture intends to make use of these varieties in its work with barleys and as a consequence we have now at Washington, 2200 pounds of each of seven varieties of pedigreed barleys with which we are ready to begin work. These barleys we intend to test thoroughly in the barley areas of the United States making a careful study of their yields, plant characteristics and adaptability to the varying environments of soil and climate found throughout our country, for we find that grains change materially under changes of environment.

With this in view, we have during the past few months arranged to test these seven varieties at thirty-five places

throughout the United States. These experiments are placed so that we may have the widest possible variation of latitude without change of longitude. We have for instance one or more experiments in each of the states extending from Texas on the south to the northern boundry of North Dakota on the north. We have also a series of experiments extending from Washington, D. C., to California. These experiments will be visited during the growing season and a careful study made of the yield and characteristics. Similar tests from year to year with comparison will finally give us data by which we may make a wise choice of the variety to locate in any of the barley areas of the United States. Not only do we intend to conduct tests for yields, but we plan to subject our varieties to the most rigid tests for the market, disseminating them by placing them in the hands of maltsters and brewers for malting and brewing tests. We have with this in mind, arranged with Mr. Otto Toepfer near Madison to grow twenty acres of three varieties namely, Hanchen, Primus and Princes. The Pabst Brewing Co., of Milwaukee has promised to conduct a test for us and a number of others stand ready to make similar tests.

Thus after satisfying ourselves of the actual market value of each of our pedigreed varieties as to malting and after determining the yield and other characteristics on various soils and under varying environments, we shall be able to locate in each barley growing section the barley which will be best for that section and which will bring the best price on the market.

We shall, therefore, pursue for the whole United States, the policy which Prof. Moore is planning to carry out in this state, namely to establish large areas in the barley growing sections of the United States, where only one variety of barley shall be grown. Thus shall we be able to keep pure the varieties which we introduce into each area as pure varieties.

MARKETING THE BARLEY CROP.

OTTO TOEPFER, MADISON, DANE COUNTY.

The past history of barley markets have shown a variation up and down with many a long period of depression. The main market has usually been created by the brewing interests. In the past barley was thought of little value for anything but malting and brewing, but we have of late years been learning that barley is one of our best feeds. Hence, has arisen a new demand upon the market and a consequent stimulant for bringing and holding up the price.

The Wisconsin Grain and Warehouse Commission, which organization is established under the laws of Wisconsin, determines to a large extent the market classification of barleys as it does with other grains. According to their determination barleys are today classified upon the market as feeding and malting barleys, and under each of these classifications are grades one, two, and three.

For grade No. 1 the requirements are that the barley shall be plump, bright, clean and free from foreign seeds, and weigh not less than forty-eight pounds to the measured bushel.

No. 2 must be sound, of healthy color, reasonably clean and free from foreign seeds, and test not less than forty-six pounds to the measured bushel.

No. 3 shall include all slightly shrunken and otherwise damaged barley not good enough for No. 2 and shall test not less than forty-four pounds to the measured bushel.

For feeding barley the standard is not so high as the requirements for No. 1., the barley shall be reasonable sweet and sound and weigh forty pounds to the measured bushel.

No. 2 shall include all barley which is for any reason unfit for malting purposes and may include a liberal sprinkling of foreign grains and seeds. The great emphasis which is at present being placed upon the feeding value of barley, and the many experiments upon this subject will soon give an additional value to the feeding barley, which has the highest per cent of protein. And barleys will gain a known reputation for feeding barleys according to the amount of protein which each contains. In this contest, Oderbrucker, with a protein test of fifteen per cent will stand high at Chicago. The average

prices of No. 1 malting barley during the months of June to December, 1906, has been between fifty and fifty-five cents. The year 1905 the same barley averaged about forty-five cents per bushel. Feed barley No. 1 has averaged forty-one cents, while last year the average was thirty-seven cents showing in all a gain in price the present year over the preceding.

While it is important that we shall know something of the general market requirements it is most important for us as farmers of Wisconsin and members of the Experiment Association to discuss this matter from a standpoint of the seed market.

Wisconsin is not a great prairie state where grain can be produced upon a vast acreage and handled on an exceedingly large scale, by the most improved machinery. We cannot, therefore, expect to compete most successfully with our sister states of the west upon the general market. But we have an advantage which our location gives to us in growing seed grains. Wisconsin is situated far to the north within the modifying influence of the great lakes, with a soil which supplies to the grains the proper proportion of the elements of nourishment. Because of this we must become a great seed growing state, and strive to learn and emphasize the accomplishments which tend toward that end. Some of us can already bear testimony to the profitableness of carrying out the policy from the fact that we have in this way been able to more than double the prices on our products. Now there are some properties of our grains, which we must look after very carefully,if we are to continue this business. The first and foremost of these is securing a continual high germinating power of our grains. We cannot expect to sell seed grain testing but from fifty to seventy-five per cent to the same man twice. We must keep it at least above ninety per cent. This can be done only by using care in harvesting, stacking, threshing and storing. We cannot expect to continue to sell grains for seed, if our seed is gradually losing its plumpness because we do not use care in cleaning and take out the small kernels before sowing. Plumpness is one of the prime characteristics and must be secured even if you must separate your grain with a fanning mill before selling. It would no doubt be a winning policy for all our seed growers to practice the careful cleaning of the grain, which they sell in all cases. This would have a good influence upon the buyers and lead them to return for future purchases.

On looking back upon the profits of the past year we find that our members have harvested good crops of barley and sold them for a good price. The prices have ranged from sixty-five to one dollar and fifty cents per bushel, according to the quality of the barley, and the ability of the grower as a selling agent. In 1905 the price was about one dollar, but only a few parties had seed barley for sale. The past year many members have had Oderbrucker seed barley for sale. The majority have been able to sell all and more than they have had on hand for seed. These who failed to sell in many cases have not exerted themselves in advertising their product.

The reputation of Wisconsin seed barley has spread far and wide, during the past year, calls coming to us from as far distant places as Utah and Washington. The grain exhibit and competition at our annual meetings should be used by every member of the association. Every member should have grain here and show it; he should also exhibit at the state and county fairs. We must consider the future as well as the present, therefore, do your best to satisfy every customer. Do better by him than he could expect you to do, be honest, square in every dealing and your customer will stay by you and the Association will be thus benefited.

HARVESTING AND THRESHING BARLEY.

L. R. ZERBEL, MADISON, DANE COUNTY.

Great attention should be given to the harvesting and threshing of barley. Too little care has been bestowed upon this important operation as a great deal of barley has been damaged by dew or rain or by improper handling of some kind, therefore the selling value has depreciated materially. An important part is the time to harvest. To obtain the best results barley should never be cut until it is good and ripe, often barley is cut too green or not fully matured which will make for malting purposes a flinty malt, lacking in color and flavor. It is also important not to leave barley uncut after it is ripe as it will discolor easily by dew at that stage. The value of barley for malting purposes depends on the color, also

on the test of germination as all malting barley must be sprouted in the malt house and prices are paid for it accordingly, therefore, it is well to let barley ripen well as it gives a better germinating test. Barley should be well shocked, the shocks should be of medium size, it is well to shock the barley soon after it is cut so as to protect the sheaves from the weather. About six bundles set up at a proper angle, one bundle on each side with two bundles well placed on top of the lower eight for caps, make a desirable shock, this style of a shock will allow the air to circulate through it freely which will dry out the bundles in a short time so that they can be stacked without remaining in the field exposed to the weather long. It is well to let the barley dry out well before it is stacked. One week is sometimes sufficient, this of course depends entirely upon the weather.

For brewing purposes barley should always be stacked and allowed to go through a sweat before it is threshed, as best results are obtained by doing so. When stacking the barley it is best to stack the cap sheaves separate in a stack called No. 2 quality, and the protected bright colored bundles in a stack called No. 1 quality. This is by far the best way to grade barley. If the discolored cap bundles are stacked together with the bright ones it will be impossible to grade it after it is threshed and consequently a decline in value of the discolored and damaged barley that has been mixed, will result. In stacking it is best to build medium sized stacks, about seven good loads makes a stack of proper size. Stacks should not be built too close together, but should have space enough between them so that the air can circulate freely between them which we find is a great help in curing the grain for threshing. Stacks of medium size dry out better and also save labor at time of stacking as well as at the time of threshing. Care and good judgment should be exercised at the time of threshing, especially if the grain is dry. The concaves in the machine should not be set too close. It is often necessary to take out some of the teeth from the concaves, the speed of the machine should be reduced so that the kernels are not broken nor the beards clipped off too close to the kernels, which is detrimental for malting purposes. Damaged and broken kernels if put in the malt house to sprout will form a mold on the injured parts, which is not wanted by the maltsters, nor will such barley grow well if sown in the ground. For feeding purposes it would not make much difference, dis-

colored and broken kernels have practically the same feeding value as bright colored barley, as the feeding value is not changed by the color, but the price is for malting barley.

The difference in price paid for malting and feeding barley is about ten cents per bushel, sometimes more in favor of the malting. If barley is cut at the proper time, care taken in the shocking and stacking, and a little common sense exercised at the time of threshing, I am sure it would mean to the farmer a revenue far in excess of the little extra labor expended.

COOPERATIVE EXPERIMENTS WITH ODERBRUCKER BARLEY.

H. A. MAIN, FORT ATKINSON, JEFFERSON COUNTY.

I sowed twelve acres of Oderbrucker barley on a medium loam soil which had been in corn the previous year. I took lots of pains to fit my land and did not sow till May 12th, when the ground was warm. The barley grew fast and was cut the latter part of July. We threshed fifty bushels by weight per acre of good barley. When sowing I set my drill to sow two bushels per acre, but at the finish had to sow less to make my seed hold out.

I could not tell the difference in the stand between that sowed two bushels per acre and where less was sown.

ODERBRUCKER BARLEY.

H. J. RENK, SUN PRAIRIE, DANE COUNTY.

We have now grown this variety of barley the past two seasons, and have found it very satisfactory. We have only grown it one year in connection with other varieties, and that

being the Manshury. We noticed the heads were somewhat longer and heavier than the Manshury also a plumper berry and somewhat stiffer straw. We think it should prove especially valuable on land that is in only a moderate state of cultivation, as it appears to make a strong vigorous growth the fore part of the season. It also has a strong root development with lots of vitality, making it especially desirable on above mentioned soil. As a yielder we consider it good, perhaps second to none in that respect.

With us it produced very nearly thirty-four bushels per acre by machine measure, on rather light prairie soil which cannot be made to produce as much per acre nor as plump grain as good clay soil. It is a good malting barley as has been shown by tests made by an Institute of Fermentology at Chicago, and has considerably higher protein content than is usually found in other barleys, making it a valuable feed for stock when discolored or otherwise unmarketable.

ODERBRUCKER BARLEY.

P. A. DUKLETH, MUKWONAGO, WAUKESHA COUNTY.

What I can say regarding the Oderbrucker barley is limited, but what I have seen of its growth, yield and quality has been satisfactory.

I obtained one hundred pounds of seed barley, of the Oderbrucker variety from this association. This amount was sown at the rate of seventy pounds per acre. This was of course a little thin seeding for the kind of soil I used for the trial plot, but as I wished to cover a certain piece of land with the seed I had, I set the seeder (broadcast) accordingly.

The nature of the soil on this plot was part clay and part black soil, the lower part of the plot was underdrained and had been manured the previous year for sweet corn, spring plowed, and smoothed with a smoothing harrow before seeding. It was plowed rather too wet and laid undragged after plowing over Sunday. This made it lumpy and it was not in the best of condition when seeded, part was rolled after it had

been dragged several times, and part not rolled but no change was noticed in the stand of the barley on the rolled and unrolled parts.

Weather was favorable after seeding and it came up strong and with good color, made a good stiff straw which stood up excellently both on the lower and higher parts of the field. It was cut July 14 and at that time it was evenly ripened. It yielded forty bushels by measure—measured in two bushel sacks from the threshing machine, same was weighed and averaged 113 pounds to the sack.

I was well pleased with the yield, considering the thin seeding and condition of seed bed. Its quality was good, kernels being plumper and more of a uniform in size than the common barley raised in this vicinity.

Those who have seen this barley since I threshed have appreciated its quality and a good demand for seed exists.

I am so satisfied with the trial of this variety this year, that I will try ten acres of it next year.

ODERBRUCKER BARLEY.

P. C. NELSON, MILLTOWN, POLK COUNTY.

Mr. President, Members, Ladies and Gentlemen:—

I will in a few words give my experience with Oderbrucker barley. I received in the spring of 1906 two bushels of barley from the Wisconsin Agricultural Experiment Association, which I sowed broadcast April 23rd on seven-eighths acres of well-drained, slightly rolling, clay loam. It was my intention to sow it on one acre, but I had the machine adjusted so that the seed ran faster than I thought it did.

It grew well to a height of about three and one-half feet, it had a well filled six rowed spike of fine kernels, and had a clear, strong straw, and stood up well when I harvested it July 25th. I stacked it August 14th and threshed it Sept. 27th, and received forty-two bushels of good barley.

As far as my experience goes with Oderbrucker barley, I am well pleased with it.

ODERBRUCKER BARLEY.

CLARENCE CLARK, MARKESAN, GREEN LAKE COUNTY.

Fellow Members of the Experiment Association:—
I received two bushels of Oderbrucker barley from the Association last year which sowed one acre. The soil was a black loam with a clay subsoil. The barley was sown April 27th on fall plowed land that had been to corn the year before. It came up soon and grew well, heading out about four days before the other variety in the next field. It was cut before the other field and I found that the heads were longer and better filled. The Oderbrucker barley was not affected much with smut, not so much as the barley in the adjoining field. The barley was cut the 25th of July and put in shocks and stood there till threshed; this was about two weeks and then threshed out of the field. I secured a yield of forty-one and one-half bushels per acre, and the barley in the next field which I spoke of only yielded thirty-five bushels to the acre.

I think the Oderbrucker barley is the best for Wisconsin for it is a large yielder, gets ripe early and is of a good quality.

ODERBRUCKER BARLEY.

H. E. KRUEGER, BEAVER DAM, DODGE COUNTY.

Mr. President, Fellow Members, Ladies and Gentlemen:—
It is a great pleasure for me to have the opportunity to meet so many of you here today, and tell you of my experience with Oderbrucker barley.

Last spring it was my good fortune to receive from this Association, two bushels of this wonderful barley. April 25th I sowed it broadcast on one acre of fall plowed clay loam soil which had been manured the fall previous. It was sown along side my Manshury barley leaving a space of two feet between the two varieties so as not to get them mixed. Both varieties

were seen above ground the same time and no difference could be seen until it was ripe; then the Oderbrucker seemed to have a more yellowish hue than the Manshury. It was harvested July 24th, both varieties ripening the same time.

The Oderbrucker was kept separate and threshed separate and from the two bushels of seed I got forty-two bushels. The Manshury only yielding thirty-six bushels per acre under the same conditions which shows that the Oderbrucker out-yielded the Manshury six bushels per acre. It has a stiffer straw than the Manshury. Very little smut was noticeable. Did not rust, stood up well and had a good length of straw.

Analyses made by the Wahl-Henius Institute of Fermentology of Chicago showed the Oderbrucker barley to have a protein content of fifteen per cent, two per cent over the Manshury. It has also been tested for malting and brewing purposes, and has proven to be highly satisfactory. Another point in favor of this barley is that it is very heavy, weighing more per measured bushel than any I have ever raised.

ODERBRUCKER BARLEY.

ROBERT JAMISON, APPLETON, OUTAGAMIE COUNTY.

Members of the Experiment Association:—

I have had but little experience in growing Oderbrucker barley, but will give you what little experience I have had.

In the spring of 1906, I received two bushels of seed. This was sown on one acre, the ground was high and sloping, the soil being a stiff red clay. The field was in corn the previous year, and the ground was fall plowed, and well disked in the spring before sowing. The barley was sown the 27th of April, then harrowed and rolled. The barley grew well and it was not long before the Oderbrucker barley was ahead of the other variety. The straw and blades of the Oderbrucker barley was similar to that of oats, while the other variety of barley had fine blades. The Oderbrucker barley did not lodge, and at cutting time was three or four inches higher than the other variety, and it produced more straw as well as more grain to

the acre. The Oderbrucker barley yielded forty-four bushels per acre, which I consider a good yield on account of being sown so late.

ODERBRUCKER BARLEY.

IVAN J. GRIMWOOD, BRISTOL, ILLINOIS.

The two bushels of Oderbrucker barley received from the Wisconsin Experiment Association was sown April 18, 1906, on ¾ of an acre of well drained clay loam. It made an excellent growth early, but was held down later by need of water the same as the hay crop in this section. It was harvested July 17th, and stood in the shock until August 28th. The straw was rather short which I think was due to the season. Twenty-two bushels were threshed from the ¾ acre, making a yield of about thirty bushels per acre. The barley was of fine quality and was all saved for seed purposes this year.

Barley is quite a new crop here, but many are commencing to raise it for hog-feeding and with a yield of thirty-four bushels per acre it will be a paying crop to raise when the price of wheat middlings, tankage, etc., are considered.

We also seeded this plot to alfalfa and the barley seems much ahead of oats for a nurse crop not shading the ground so much and being harvested earlier.

ODERBRUCKER BARLEY.

ANTHONY RIEK, SPRING GREEN, SAUK COUNTY.

In the spring of 1906, as a member of the Association, I received two bushels of Oderbrucker barley, which I took to my home in Sauk County to carry on a test. The seed was sown

on a plot of fall plowed ground, covering about seven-eighths of an acre of a heavy clay soil, on which corn had been grown the year previous

This was not just the right kind of soil for barley which was demonstrated by the fact that the kernels were not as full and plump as they should have been, but it was the only plot I could devote to it. The weather being quite favorable the barley came up fine, and made a splendid growth all through the season. It ripened evenly and showed no smut. The straw is quite a good deal stiffer than in most varieties, and although it was lodged by some heavy storms it stood up better than any variety I have seen growing in our neighborhood.

The crop was cut July 26th and stacked before a drop of rain had fallen upon the shocks. This plot yielded about forty bushels or at the rate of about forty-five bushels per acre which was several bushels above the average run of other varieties. Although no rain had fallen upon the barley after it had been cut the grain after threshing had quite a dark yellowish or brownish hue. This may come from the heavy rains that fell while the barley was ripening, but I lay the greatest part to the clay soil as most barley grown in our district has this brownish hue.

Considering all points as far as my experience goes, I consider the Oderbrucker quite superior to any variety I have seen grown in our district.

ODERBRUCKER BARLEY.

J. O. GANGSTAD, DEERFIELD, DANE COUNTY.

Last spring I received two bushels of Oderbrucker barley from the Experiment Association, which gave a germination test of ninety-nine percent. I sowed the barley with drill on one acre of clay loam soil, fall plowed.

The barley came up nicely and gave a fine even stand. It grew rapidly and reached the height of about three and one-half feet. It didn't seem to ripen quite as fast as the other

variety I had, but the heads filled out better and became plump, which made it a first class seed barley.

I harvested it and since there was no threshing machine around in the neighborhood at that time, I stacked it and about four weeks later I threshed out forty-three bushels of fine barley. This was not the highest yield of Oderbucker barley, but was far superior to the other variety I had.

The Oderbrucker barley has a stiff straw and does not lodge as badly as most varieties. I am well satisfied with it, and expect to put in fifteen or twenty acres of it this year.

THE SEASON'S BARLEY CROP.

IVAN MCINTYRE, FORT ATKINSON, JEFFERSON COUNTY.

Every grower of barley should test his seed before sowing. The vitality of barley is more easily injured by heating in stack or bin, than is that of oats or wheat. Age too, lowers its vitality. A determination of the seeds power to grow, is therefore absolutely necessary for the success of the future crop. Samples for the germination test, should be selected from grain which has been previously cleaned and graded. Cleaned to remove light and immatured barley, weed seeds and foreign material. Graded to secure the plumpest and largest seeds, a uniformity in size and maturity of the grain, will insure an even growth and maturity of the crop.

A tester for testing the samples can be easily made by using two tin plates, one slightly smaller than the other. Cotton flannel pads are cut of the same size as the inside of the under plate. The pads are soaked in water and squeezed to remove surplus moisture. A pad is put in bottom of larger plate and grain sample distributed over it. Another pad is placed upon the seed and the smaller plate inverted and used as a cover to prevent evaporation. This tester should be placed in a convenient place where the temperature is between 74 and 80 degrees F. Water can be added to pads when they become somewhat dry. A record of the test should be kept and sprouted seeds removed from day to day.

The germination power of the seed having been settled, the

preparation for the sowing of the same, now occupies the attention of the grower. Barley grows best on a fertile, well drained, slightly sandy soil, which may have been recently manured. Unlike oats, its straw is short and will not lodge as easily.

Rotation is an important factor in the successful growing of barley. It should not follow itself too closely. This is more true of barley than other of our common cereals. An excellent rotation is clover and timothy two years, corn one year followed the next by barley.

What ever the nature of the soil may be, a well prepared seed bed is necessary. The ground should be plowed and worked until a deep, well pulverized, level seed bed is obtained. Such a bed will most efficiently aid in supplying the necessary factors for germination, heat, moisture and oxygen.

If the season is far enough advanced and all danger of severe weather past, the barley is sowed. A drill is the best implement for this purpose, as it distributes the seed evenly and at a uniform depth. The depth may vary to suit the condition of the soil. The nearer the seed to the moist soil, the better. This even distribution, at a uniform depth, promotes an even growth and maturity.

The rate of seeding varies. Probably the most satisfactory results are obtained by using two bushels per acre. A very thin seeding is apt to induce excessive tilling, thus causing irregular and late ripening. The value of the grain for brewing purposes depends entirely upon the uniform ripening and perfect maturity.

Such a testing of the seed, such a sowing for the season's crop, are essential for the realization of a successful harvest.

"THE CEDARS."

Farm home of Mrs. Eva Lehmann, Neosho, Dodge County.

The farm known as "The Cedars" comprises one hundred and sixty acres of fine farming lands and is owned and managed by Mrs. Lehmann. Besides the farm home, Mrs. Lehmann owns one hundred and sixty acres which is usually rented so as to direct to better advantage the home farm.

Dairying and pure bred seed grains are the specialties upon the farm. At the present time the herd consists of forty-five head of cows and young stock, the larger number of which are pure bred and high grade Guernseys. The dairy is up-to-date in every respect having cream separator and all appliances for keeping the dairy products in the best possible condition. First prizes were won on the butter from this dairy at the state and Dodge county fairs. Horses, hogs and poultry are also kept upon the farm from which a considerable income is received.

Oderbrucker barley and Wisconsin No. 4 oats are grown upon the farm as the leading grain crops and alfalfa, clover and corn are leading forage crops.

"THE CEDARS"

Mrs. Lehmann has two sons and four daughters. Both sons have been given an opportunity of securing a University training, one completing the Engineering course last year, and the other is a senior in the College of Letters and Science.

Mrs. Lehmann not only runs an up-to-date farm, but is an excellent speaker on farm topics and takes an active interest in Farmers' Institutes and agricultural meetings in general.

"THE ELMS."

Farm home owned by Hon. R. D. Marshall, Delton, Sauk County.

The farm known as "The Elms" now comprises about 1400 acres, situated in the town of Delton, Sauk county, Wisconsin, It is the property of Justice R. D. Marshall, of the Wisconsin Supreme Court and has been built up by adding to the old Marshall homestead of 120 acres purchased and settled on by Justice Marshall's father in 1854. It has been farmed continuously by the Marshall family since that time. The farm is devoted to raising and finishing cattle, sheep and hogs. The

"THE ELMS."

crops are corn, oats and hay, all of which are fed upon the farm. There are over 500 acres under cultivation, the balance in blue grass pasture. The crops grown for the past few years are much better than those grown 40 years ago. The land, from continual manuring and clovering, has materially increased in fertility. Justice Marshall passed his boyhood on this farm, spends his vacation there, and takes pride in being classed as one of the farmers of Wisconsin. The farm is managed by W. S. Marshall, elder brother of the Justice.

BUSINESS MEETING.

Business meeting of the Wisconsin Agricultural Experiment Association, Thursday, February 7, 1907, 2 P. M., Agricultural Hall.

Called to order by the president, A. L. Stone. The minutes of the last meeting were read and adopted, after which the following officers were elected:

President.....A. L. Stone, Madison.
Vice-President.....H. A. Main, Ft. Atkinson.
Secretary .....R. A. Moore, Madison.
Treasurer.....H. W. Meekin, Fond du Lac.

On motion Mrs. Eva Lehmann, Neosho, Wis., and S. T. Utsunomiya, Sapporo, Hokkaido, Japan, were made honorary members of the Experiment Association.

RESOLUTIONS.

The following resolutions were reported by the Committee and unanimously adopted:

Realizing that through the energetic efforts of the Wisconsin Agricultural Association in the growing and dissemination of pure bred seed grains, that the yield per acre has been materially increased during the past five years, also that through the efforts of the Association several thousand tests in the state are carried on annually with selected grains and forage plants, that are of great educational value to neighboring farmers, who observe these tests,

THEREFORE, BE IT RESOLVED, That we urgently request the legislature now assembled to grant such additional aid as is provided for in Bill No. 163 A, now pending before the legislature, also that the Secretary forward a copy of these resolutions to each member of the legislature.

WHEREAS, The practice of Congressional distribution of garden seeds has for a number of years met with the almost united disapproval of practical farmers in all parts of the United States,

WHEREAS, It has been fully demonstrated that in the majority of cases the seed thus disseminated has been inferior in character and of ordinary or almost worthless varieties,

THEREFORE BE IT RESOLVED, By the Wisconsin Agricultural Experiment Association in annual convention assembled that we heartily condemn the present practice of free seed distribution.

BE IT FURTHER RESOLVED, That a copy of this resolution be forwarded to each of our representatives and senators in Congress.

Realizing the importance of better rural highways as a factor in the enhancement of land values and in the furtherance of low cost of marketing farm produce,

BE IT RESOLVED, That it is the sense of this meeting that each member of this association should put forth his best efforts without interferring with his private undertakings, to co-operate with the State Geological Survey in the interests of rural road improvement.

TREASURER'S REPORT.

P. A. Dukleth, Treasurer of the Association, made the following report, which was duly accepted.

Report as rendered by Treasurer, February 7, 1907.

Receipts.

		Money in treasury February 9, 1906, time of last meeting	$190 20
Feb.	9.	From members as fees	29 50
Feb.	15.	From Secretary as membership fees	18 00
Feb.	28.	From member as fee	50
Mar.	26.	From members as fees	2 00
Mar.	27.	From Secretary as membership fees	35 00
Mar.	30.	From member as fee	50
Apr.	9.	From Secretary as membership fees	27 00
Apr.	9.	From S. W. Bolton, 18 lbs. alfalfa seed	3 00
Apr.	20.	From members as fees	1 00
May	4.	From member as fee	50
June	21.	From Clerk as membership fees	15 00
		Total receipts	$322 30

Disbursements.

1906.			
Feb.	10.	To O. R. Frauenheim for seed corn....$	1 50
Feb.	10.	To Rosenow Bros., for premiums on grains	16 00
Feb.	10.	To W. A. Toole for premiums on grain.	3 00
Feb.	10.	To Fred P. Grebe for premiums on grain	12 00
Feb.	10.	To P. A. Dukleth for premium on grains	2 00
Feb.	10.	To W. O. Christiansen for premium on grains	2 00
Feb.	10.	To J. P. Bonzelet for premium on grain	3 00
Feb.	10.	To O. R. Frauenheim for premium on grains	6 00
Feb.	10.	To Samuel Stienstra for premium on grain	4 00
Feb.	10.	To O. C. Feathers for premium on grain	1 00
Feb.	10.	To G. Hanson premium on grain.....	3 00
Feb.	10.	To Howard Palmer for premium on grain	2 00
Feb.	10.	To George Morris for premium on grain	2 00
Feb.	10.	To W. H. Stantorf premium on grain..	1 00
Feb.	10.	To Arthur Cooper premiums on grain..	5 00
Feb.	10.	To H. B. Smith premium on grain	2 00
Feb.	10.	To Floyd McKichan premium on grain.	50
Feb.	10.	To A. M. Anderson premium on grain..	2 50
Feb.	10.	To H. N. Longley premium on grain...	1 00
Feb.	10.	To R. N. West premiums on grains.....	11 50
Feb.	10.	To Samuel Herdrich premium on grain.	1 00
Feb.	10.	To H. W. Meekin premiums on grain..	9 00
Feb.	10.	To L. P. Martiny premium on grain..	2 00
Feb.	10.	To Clyde Akins premium on grains....	3 50
Feb.	10.	To Ivan McIntyre premium on grains..	50
Feb.	10.	To H. F. Kramer premium on grain...	2 00
Feb.	10.	To V. G. Ellis premiums on grain.....	3 00
Feb.	10.	To J. H. McNown premiums on grain..	8 00
Feb.	10.	To J. F. Koltes premium on grain.....	2 00
Feb.	10.	To J. M. Keys premium on grain.....	1 00
Feb.	10.	To W. L. Illian premiums on grain....	4 00
Feb.	10.	To A. L. Greengo premium on grain....	50
Feb.	10.	To R. J. Schaefer premium on grain...	2 00
Feb.	10.	To Gottlieb Muehleisen premiums on grains	3 00
Feb.	10.	To Clarence Jordalen premium on grain	1 00

Feb.	10.	To Louis Risum premium on grain....	1 00
Feb.	10.	To Jas. B. Smiley premiums on grain..	1 00
Feb.	10.	To C. H. Howitt premiums on grain...	9 00
Feb.	10.	To A. B. Hicken premium on grain..	2 00
Feb.	10.	To Alex. Kreuger premium on grain ...	1 00
Feb.	10.	To H. L. Spink premium on grain.....	50
Feb.	10.	To Herman Roethel premium on grain..	50
Feb.	16.	To Prof. P. G. Holden, traveling expenses	20 00
Mar.	8.	To P. A. Dukleth, expenses incurred by attending annual meeting.....	9 70
Mar.	23.	To Idalyn Bibbs, general office expenses	10 00
Apr.	7.	To Democrat Prtg. Co, shipping tags...	3 00
July	25.	To Idalyn Bibbs, general office expenses.	10 00
Sept.	5.	To Idalyn Bibbs for office expenses....	20 00
Sept.	17.	To R. A. Moore for advance payment on badges, express charges, freight charges and drayage on exhibit to State Fair	18 47
Nov.	1.	To Challenge Envelope Co., for seed envelopes	20 00
1907.			
Jan.	9.	To Loeb & McKay for certificate books....	5.00
Jan.	9.	To Idalyn Bibbs for office expenses.....	10 00
		Total disbursements	$264 67
Feb.	7.	Forward total receipts.....	$322 30
		Total disbursements	264 67
		Balance in hands of Treasurer....	$57 63

P. A. DUKLETH,
Treas.

SECRETARY'S REPORT ON STATE APPROPRIATION.

R. A. Moore, Secretary of the Association, made the following financial report which was duly adopted.

Money in the state treasury Jan. 29, 1906, date of making last report $243.52
State appropriation for 1906 ..... 1,000.00

Total $1243.52

Disbursements.

1906.			
Jan.	30	Milwaukee Bag Co., seed grain bags.....	$ 81 12
Jan.	30	Parsons Ptg Co., letterheads, prog'ms, etc	47 50
Feb.	26	L. L. Olds, Clinton, judging exhibit and expenses	8 90
Feb.	28	Miss Bibbs, clerical services	5 00
Mar.	5	Milwaukee Bag Co., 500 cot. pk. sacks..	20 00
Mar.	21	Milwaukee Bag Co., 300-2 bu. grain bags	29 25
Mar.	28	Miss Bibbs, clerical services.....	5 00
Apr.	23	Miss Bibbs, clerical services	5 00
May	28	Miss Bibbs, clerical services	5 00
June	23	Miss Bibbs, clerical services	5 00
July	2	Salzer Seed Co., 1,000 lbs. Barr alfalfa seed	146 26
July	2	Parsons Ptg. Co., letterheads, mimeograph papers	17 75
July	24	Miss Bibbs, clerical services	5 00
July	31	E. W. Keyes, Postmaster, stamps.....	50 00
Aug.	1	Democrat Prtg. Co., 5,000 seed grain grower's lists	30 00
Aug.	15	Democrat Prtg. Co., 5,000 envelopes ...	13 75
Aug.	25	Miss Bibbs, clerical services	5 00
Sept.	5	R. A. Moore, expenses lecturing at Dill..	6 04
Sept.	1	E. C. Nielson, 10 enlarged pictures	43 50
Sept.	17	A. L. Stone, trav. expenses, State Fair ..	15 15
Sept.	17	R. A. Moore, trav. expenses, State Fair..	11 05
Sept.	25	Miss Bibbs, clerical services	5 00
Sept.	27	J. P. Bonzelet, trav. expenses, State Fair	8 95

Sept.	27	To amount forwarded	$569 22
Sept.	28	H. A. Main, trav. expenses, State Fair..	11 89
Oct.	8	Ray N. West, trav. expenses, State Fair .	10 10
Oct.	25	Miss Bibbs, clerical services	5 00
Nov.	26	Miss Bibbs, clerical services	5 00
Dec.	20	Miss Bibbs, clerical services	5 00
Dec.	22	Wis. Exp. Station, 600 bu. barley at 50c .	300 00
Jan.	11	Democrat Prtg. Co., 3,000 letterheads ..	9 00
Jan.	22	M. C. Lilley & Co., Columbus, Ohio, 700 badges at 6c	47 25
Jan.	23	E. W. Keyes, Postmaster, 300 1c stamps .	30 00
Jan.	28	Loeb & McKay, envelopes, programs, entry tags	25 75
Jan.	28	Miss Bibbs, clerical services	5 00
Feb.	1	Milwaukee Bag Co., grain sacks	119 92
		Total	$1,143.13

1907.

Feb. 5	Total receipts in State Treasury	$1,243 52
	Total disbursements from State Treasury ..	1,143 13
	Balance in State Treasury	$ 100.39

DISPLAY OF GRAINS AND FORAGE PLANTS FOR 1907.

Perhaps one of the most attractive features of the last annual meeting of the Experiment Association was the display of grains and forage plants. Approximately two hundred dollars had been set aside for premiums to be paid for the best exhibits of pure-bred seed grains. The quality of the grain displayed was of a high standard and the interest taken in the exhibit was such that the Association deems it advisable to continue this line of effort.

We feel that much can be done in the way of encouraging the dissemination of good seeds free from obnoxious weeds that have been grown in our own state.

As soon as the Experiment Association demonstrates to the seedsmen and farmers of Wisconsin that good seed can be grown within our borders which is acclimated to our home conditions, it will not be necessary for them to place their orders with growers from other states. The seedsmen of our state and of adjoining states will be only too pleased to assist in the dissemination of home grown seeds if they can be shown that the quality is equally as good or better than they can get elsewhere. Realizing the great improvement that can be made in the growing of farm crops we trust that every member of the association will do all in his power to assist in every possible manner in the production of choice grains and forage plants for our next display.

PARTIES AWARDED PREMIUMS AT THE WISCONSIN AGRICULTURAL EXPERIMENT ASSOCIATION MEETING, FEB. 7TH AND 8TH, 1907.

Class 1a.—Best ½ peck Swedish Select Oats (Wis. No. 4).

First premium	—Emil L. Dreger, Madison, Wis., R. F. D. No. 7	$3 00
Second "	—J. P. Bonzelet, Eden, Wis.	2 00
Third "	—C. H. Howitt, Randolph, Wis.	1 00
Fourth "	—H. F. Kramer Bloomer, Wis.	50

Class 1b.—Best ½ peck any other variety.

First premium	—C. H. Howitt, Randolph, Wis.	$3 00
Second "	—Ray N. West, Ripon, Wis.	2 00
Third "	—Henry Whitehead, Leon, Wis.	1 00
Fourth "	—Neal Houslet, Packwaukee, Wis.	50

Class 2a.—Best bundle Swedish Select Oats (Wisconsin No. 4).

First premium	—C. H. Howitt, Randolph, Wis.	$3	00
Second "	—Emil L. Dreger, Madison, Wis.	2	00
Third "	—H. W. Meekin, Fond du Lac, Wis.	1	00
Fourth "	—O. F. Miritz, Fond du Lac, Wis.		50

Class 2b.—Best bundle any variety of oats.

First premium	—C. H. Howitt, Randolph, Wis.	$3	00
Second "	—Ray N. West, Ripon, Wis.	2	00
Third "	—Fred P. Grebe, Fox Lake, Wis.	1	00
Fourth "	—H. W. Meekin, Fond du Lac, Wis.		50

Class 3a.—Best ½ peck Manshury Barley.

First premium	—C. H. Howitt, Randolph, Wis.	$3	00
Second "	—Jos. N. Bohl, Beaver Dam, Wis.	2	00
Third "	—Ray N. West, Ripon, Wis.	1	00
Fourth "	—H. E. Krueger, Beaver Dam, Wis.		50

Class 3b.—Best ½ peck Oderbrucker Barley.

First premium	—J. P. Bonzelet, Eden, Wis.	$3	00
Second "	—C. H. Howitt, Randolph, Wis.	2	00
Third "	—Alvin Heinke, New London, Wis.	1	00
Fourth "	—H. E. Krueger, Beaver Dam, Wis.		50

Class 3c.—Best ½ peck any other variety of barley.

First premium	—H. E. Krueger, Beaver Dam, Wis.	$3	00
Second "	—Ray N. West, Ripon, Wis.	2	00
Third "	—H. N. Longley, Dousman, Wis.	1	00
Fourth "	—Jos. N. Bohl, Beaver Dam, Wis.		50

Class 4a.—Best bundle of Manshury Barley.

First premium	—C. H. Howitt, Randolph. Wis.	$3	00
Second "	—Geo. A. Stivarius Fennimore, Wis.	2	00
Third "	—H. E. Krueger, Beaver Dam, Wis.	1	00
Fourth "	—Ray N. West, Ripon, Wis.		50

Class 4b.—Best bundle of Oderbrucker Barley.

First premium	—E. A. Beule, Fox Lake, Wis.	$3	00
Second "	—J. P. Bonzelet, Eden, Wis.	2	00
Third "	—C. H. Howitt, Randolph, Wis.	1	00
Fourth "	—Ray N. West, Ripon, Wis.		50

Class 4c.—Best bundle of any variety of barley.

First premium	—Fred P. Grebe, Fox Lake, Wis.	$3	00
Second "	—H. N. Longley, Dousman, Wis.	2	00
Third "	—H. E. Krueger, Beaver Dam, Wis.	1	00
Fourth "	—Jos. N. Bohl, Beaver Dam, Wis.		50

Class 5a.—Best ten ears Clark's Yellow Dent (Wis. No. 1).

First premium	—C. H. Howitt. Randolph, Wis.	$3	00
Second "	—J. H. McNown, Mauston, Wis.	2	00
Third "	—Jas. B. Smiley, Albany, Wis.	1	00

Class 5b.—Best ten ears, Silver King corn (Wis. No. 7).

First premium	—Ike Blood, Mukwonago, Wis.	$3	00
Second "	—H. N. Longley, Dousman, Wis.	2	00
Third "	—H. A. Main, Ft. Atkinson, Wis.	1	00
Fourth "	—Clyde E. Akins, Warren, Ill.		50

Class 5c.—Best ten ears (Wisconsin No. 8) corn.

First premium	—H. W. Meekin, Fond du Lac, Wis	$3	00
Second "	—Horace Whittaker, Fond du Lac, Wis	2	00
Third "	—G. A. Freeman, Sparta, Wis	1	00
Fourth "	—Leon A. Carpenter, Fond du Lac, Wis		50

Class 5d.—Best ten ears, Toole's North Star Yellow dent corn.

First premium	—W. A. Toole, Baraboo, Wis	$3	00

Class 5e.—Best ten ears, Yellow flint corn.

First premium	—Clyde E. Akins, Warren, Ill	$3	00
Second "	—H. E. Krueger, Beaver Dam, Wis	2	00
Third "	— Geo. Schmit, Greenville, Wis	1	00

Class 5g—Best ten ears, any variety corn.

First premium	—Clyde E. Akins, Warren, Ill	$3	00
Second "	—Earl Usher, South Wayne, Wis	2	00
Third "	—Donald L. Bryson, Elizabeth, Ill.	1	00
Fourth "	—E. C. Elver, Madison, Wis., R. F. D. No. 3		50

Class 5h—Best single ear of corn, any variety.

First premium	—T. Thompson, Wadena, Iowa	$3	00
Second "	—J. H. McNown, Mauston, Wis	2	00
Third "	—Fred P. Grebe, Fox Lake, Wis.	1	00
Fourth "	—Clyde E. Akins, Warren, Ill		50

Class 6a—Best half peck of medium red clover seed.

First premium	—Theo. Chirstoph, Chilton, Wis	$	00
Second "	—H. W. Meekin, Fond du Lac, Wis	2	00
Third "	—J. H. McNown, Mauston, Wis	1	00
Fourth "	—W. L. Illian, Adell, Wis., R. F. D. No. 19		50

Class 6b—Best half peck of mammoth red clover seed.

First premium	—Ray N. West, Ripon, Wis	$3	00
Second "	—J. H. McNown, Mauston, Wis	2	00
Third "	—H. W. Meekin, Fond du Lac,Wis	1	00

Class 6c—Best half peck of alsike clover seed.

First premium	—H. W. Meekin, Fond du Lac, Wis	$3	00
Second "	—Ray N. West, Ripon, Wis	2	00
Third "	—W. L. Illian, Adell, Wis	1	00
Fourth "	—J. H. McNown, Mauston, Wis		50

Class 7a—Best half peck soy beans.

First premium	—Ray N. West, Ripon, Wis	$3	00
Second "	—Horace Whittaker, Fond du Lac, Wis	2	00
Third "	—H. W. Meekin, Fond du Lac, Wis	1	00
Fourth "	—H. N. Longley, Dousman, Wis		50

Class 8a—Best bundle of soy beans.

First premium	—Fred P. Grebe, Fox Lake, Wis.	$3 00
Second "	—E. A. Beule, Fox Lake, Wis.	2 00
Third "	—Ray N. West, Ripon Wis.	1 00
Fourth "	—Arthur Ochsner, Plain, Wis.	50

Class 9a—Best half peck of alfalfa seed.

First premium	—Otto C. Heidemann, Kiel, Wis., R. No. 2.	$3 00
Second "	—H. W. Meekin, Fond du Lac, Wis.	2 00

Class 10a—Best sample of alfalfa hay.

First premium	—W. L. Illian, Adell, Wis., R. F. D. No. 19.	$3 00
Second "	—Fred P. Grebe, Fox Lake, Wis.	2 00
Third "	—Geo. A. Stivarius, Fennimore, Wis.	1 00

PREMIUM LIST, 1907.

(Awards to be made February, 1908.)

DEPARTMENT OF FARM CROPS.

Class 1. Oats.

Best ½ peck Swedish Select oats (Wis. No. 4) $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best ½ peck any other variety, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Class 2. Oats in Sheaf.

Best bundle Swedish Select oats, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best bundle any other variety, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Class 3. Barley.

Best ½ peck Manshury barley, $4.00; 2nd, $3.00 3rd, $2.00; 4th, $1.00.

Best ½ peck Oderbrucker Barley, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best ½ peck any other variety, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Class 4. Barley in Sheaf.

Best bundle of Manshury barley, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best bundle of Oderbrucker Barley, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best bundle of any other variety, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Class 5. Corn.

Best ten ears, Clark's Yellow Dent (Wisconsin No. I), $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best ten ears Silver King (Wis. No. 7), $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best ten ears, (Wisconsin No. 8), $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best ten ears, North Star Yellow Dent, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best ten ears, Yellow Flint, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best ten ears, White Flint, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best ten ears any other variety, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best single ear of corn, any variety, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Class 6. Clover Seed.

Best ½ peck of medium red clover seed, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best ½ peck of mammoth red clover seed, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Best ½ peck of alsike clover seed, $4.00; 2nd, $3.00; 3rd, $2.00; 4th, $1.00.

Class 7. Soy Beans.

Best ½ peck (black) soy beans, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best ½ peck (green) soy beans, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Best ½ peck (yellow) soy beans, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Class 8. Soy Beans in Sheaf.

Best bundle of soy beans, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Class 9. Alfalfa Seed.

Best ½ peck of alfalfa seed, $4.00; 2nd, $3.00; 3rd, $2.00 4th, $1.00.

Class 10. Alfalfa Hay.

Best sample of alfalfa hay, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Class 11. Rye.

Best ½ peck winter rye, $3.00; 2nd $2.00; 3rd, $1.00; 4th, 50 cents.

Best ½ peck spring rye, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

Class 12. Timothy Seed.

Best ½ peck timothy seed, $3.00; 2nd, $2.00; 3rd, $1.00; 4th, 50 cents.

RULES AND REGULATIONS UNDER WHICH PREMIUMS ARE GIVEN.

1. The exhibitor must be a member of the Wisconsin Experiment Association.
2. Grain or forage plants must have been grown the season previous to exhibition by the exhibitor.
3. No fees will be charged for exhibiting in any classes.
4. The samples of grain and forage plants exhibited are to be retained by the Experiment Association unless a special permit is given to the exhibitor to take his sample away.
5. Exhibits are to be brought in by members of the association. If sent by express or freight all carrying charges should be prepaid.

6. Varieties of grain or forage plants not specifically named in the list can compete as "any other variety" in which case these different varieties compete against each other and not as an individual class.
7. Exhibitors cannot compete for two premiums on the same variety of grain or forage plant.
8. A proper entry of all grains, seeds, etc., must be made in the entry book at the Secretary's office before they are placed on exhibition tables.
9. Expert judges will be secured to place the awards.
10. The meeting of the association will be held at Madison in the AgronomyBuilding and rooms have been secured in that building for the exhibits.

A FEW ARTICLES ON TIMELY TOPICS.

R. A. MOORE.

GOOD SEED GRAINS.

The rapid spread of farm weeds through the dissemination of seed grains makes it necessary for the Experiment Association to use rigid means for the protection of farmers and others who purchase seeds. The object in general of our association is to promote the agricultural interests of the state and in no one capacity can we do this to more or better advantage than to keep from the market seed grains that are contaminated with obnoxious weed seeds, especially those of mustard, quack grass, Canada thistles and ox-eye daisies. No member of the Association should ever be guilty of selling or offering for sale seed grains that are contaminated with weed seeds. Any seeds shipped to farmers within this or any other state should be carefully cleaned before shipment, even though weed seeds are not present. It should be remembered that small and shrunken kernels give very poor returns. Under no conditions should grains that are intended for seed be sown on land known to be infested with obnoxious weeds.

The growers of good, clean seed grains are entitled to good prices for these seeds, but in every case they should be absolutely free from weed seeds and waste material.

Every grower of seeds before offering them for sale should make a germinating test, and under no conditions offer seeds of low vitality for sale.

Growers of seed corn should give farmers and seedsmen an opportunity to purchase fire dried seed corn in the ear; this is the only true way of purchasing seed corn and our growers should strongly advocate the method.

By all members taking pride in vying with each other in putting out good clean seed grains, we will bring about that which our association has undertaken, namely: To make Wisconsin the leading state in America for the production of good seed grains.

STANDARD VARIETIES OF SEED GRAIN FOR WISCONSIN.

For a half century or over Wisconsin live stock men have put forth special efforts to breed strains of dairy and beef cattle, second to none in our country. Hogs, sheep and horses have also received special attention. With the use of the Babcock Test and keen judgment of the breeder, a process of elimination has taken place within the herds that has resulted in placing in Wisconsin some of the best strains of live stock in the country. No longer does any farmer question the advisability of animals of the best foundation stock for breeding purposes.

This transformation of live stock from scrubs to high grades and pure breds has been the means of adding millions of dollars annually to the income of the farmer. Now when we consider that the grains and forage crops of Wisconsin are valued at over one hundred million dollars annually, is it not of equal importance that the same care and judgment be exercised in growing farm crops that we are now giving to our live stock? If the same careful judgment is exercised in farm crops work that we are now using in live stock, it is possible for the farmer to add twenty-five per cent to his yield and another twenty-five per cent to the quality and price of his crop or a total value of fifty per cent, over and above what he is now getting.

On the high priced lands of Wisconsin we cannot afford to grow scrub varieties of grains and forage plants. Our lands are highly productive and we can only afford to grow that which brings the best returns for our season's crop.

The Wisconsin Experiment Station, alive to the interests of its farmers, has during the past eight years been putting forth special efforts in breeding grains and forage plants to take the place of the scrub varieties now in existence. The process of breeding grains is a long and tedious one, and it takes time and patience to carry the plants through the course in breeding up to the time of dissemination. The chief purpose of the Wisconsin Experiment Association is to co-operate with the College of Agriculture in the growing and dissemination of high grade and pedigreed varieties of grains and forage plants. Our organization has its membership located in nearly every township of the state and can test and acclimate grains and forage plants that have been bred at the Station farm. The farms of the members are so distributed throughout the state that the choice seed grains grown thereon find easy reach to the farmers of each respective locality.

The Swedish Select oats disseminated through the Experiment Association in 1902 found such favor that no less than twelve million bushels of these oats were grown in the state the past season. The great root and leaf development of these oats make them far superior to other varieties on the poorer grades of soil.

Oderbrucker barley (Wisconin No. 55), which has been carefully bred by the Station since 1898 was given to the Experiment Association for a general test the past season. Some four hundred members grew this barley and produced approximately forty-five thousand bushels, nearly all of which will be used for seed. No less than one million bushels of this high grade barley will be grown next year so that every farmer in the state who desires to grow barley will find this barley within easy reach. Reports from the growers show that the Oderbrucker barley gave a yield of 5.6 bushels per acre over that of the best varieties placed against it.

The desire now is to have whole communities or counties grow this one select variety of barley so that maltsters or others desiring to purchase can get thousands of bushels of one select breed. This will insure uniformity of type and quality that has heretofore not existed. Several varieties of corn have been bred at the Experiment Station for different sections of the

state. The Silver King corn (Wisconsin No. 7), the past season was grown by over seven hundred members of the Experiment Association in over half of the counties of Wisconsin. This corn gave a yield of ten bushels of shelled corn per acre over the best varieties of corn compared with it for two years.

At the Station Farm a yield of seventy-five bushels of shelled corn per acre was obtained; several members of the Experiment Association received yields considerably above that obtained at the Station. A large portion of this high grade corn was grown for seed by the Association and the demand was such that the corn was sold as soon as it was fire-dried.

Another breed of corn that has attracted considerable attention is an early yellow dent (Wisconsin No. 8). This was bred for early maturity and is especially adapted for the northern and lake shore counties. This corn gave a yield of forty-seven bushels of shelled corn per acre on the sub-station farm at Iron River, Bayfield county. Several members of the Experiment Association are growing this variety of corn for seed. A new variety of corn which gives great promise is known as the Golden Glow; this variety was developed by crossing the Wisconsin No. 8 on the North Star, so as to combine the early characteristics of the No. 8 and the heavy yield of the North Star. Two years of careful selection to fix type permanently will be necessary before this corn will be sent out for trial purposes.

Many new varieties of grains and forage plants are now going through the process of breeding and will be ready for dissemination a few years hence.

It seems to the writer that Wisconsin with her fertile, well-worked lands, peculiar climate and intelligent farmers is destined to become the great seed grain state of America. A well regulated system of rotation of crops should be established, and the best high grade and pedigreed seeds secured for foundation stock. With the increase in yield and increase in price readily obtainable for such seeds the members of our association in general may still look for ample returns and good profits on their high priced lands.

MILLET AS A SEED AND FORAGE PLANT.

Millet is not so extensively grown in Wisconsin as its importance seems to warrant, and this is largely from the lack of

true appreciation of its value and knowledge of the plant itself, and best methods of culture.

The millets have been grown in Europe and Asia from prehistoric times as a human food and forage plant for animals. At the present time we find the millet crop one of the greatest crops of India. Russia produces from seventy-five to eighty million bushels of millet seed annually. In Russia, India, Japan and China, the millets are used extensively as a human food, but in America the millets are restricted almost exclusively to animal foods.

We have three distinct groups of millet known as the Club or Fox-tail, the Painole or Broom corn, and the Barnyard millet. The millets most commonly grown in the United States are the Club or Fox-tail, to which belong the following species: Common, German, Hungarian, Japanese and Golden Wonder.

The millets are grown quite largely as a catch crop usually on land designed for hay where the seeding has failed or on lands where corn or spring seedings of grain have been destroyed and the regular time for the seeding of these crops has passed.

The millet is a warm weather plant and will make little progress before the ground is thoroughly warm. The range of time in which millet can be sown is wide, varying from May 10th to July 10th in Wisconsin. Often on rich soil a crop of winter grain can be harvested and the ground then plowed and fitted for millet. When the hay crop has failed, the farmer finds no better way of getting some good hay than to put in a few acres of millet.

Millet can be sown with a drill or broadcast seeder; when the ground is dry the drill is preferable. Usually from one-half bushel to three pecks of seed per acre is sown, depending whether the desire is to use the crop for seed or hay, when for the former use the lighter seeding. The millets do exceptionally well on new sod lands and on lands that are rich and mellow; they do not thrive on the heavy clays or on wet soggy soils. The plant is shallow rooted, consequently secures its fertility near the surface therefore, seems to be hard on the soil. Where land has been so rich as to cause oats and other small grains to lodge, millet sown immediately after taking off the cereal crop will produce sufficient growth to enable one to get a fair cutting of hay and aid materially in reducing the fertility to that standard that the succeeding crop of grain will stand erect.

When the desire is to harvest for hay, millet should be cut with mower shortly after the heads appear in the blossoming

stage. The hay is relished more by farm animals and is not so dangerous to feed to horses if cut at this early stage. When the desire is to cut for seed the millet should be left until the seeds are in the dough stage; if left later the seeds shell out readily when handled causing considerable loss. A binder is used for cutting and the bundles should be bound loosely so as to allow drying to advantage. The bundles should be set up in pairs, forming a good sized shock, and left in the field for several days so as to dry out thoroughly.

Good millet hay has nearly the same feeding value as timothy and yields about the same quality of hay per acre. The yields of seed varies from twenty to fifty bushels per acre, and the weight per measured bushel varies from forty-five to fifty pounds. When the seed is used as a feed for farm animals, it should be ground and mixed with other feeds. The millets make good pasture and soiling crops as they are prolific growers after the plants reach a few inches above ground.

SHOULD GROW MORE BUCKWHEAT.

The increasing favor of buckwheat for human consumption and as an animal food has caused a great demand for it within the past two or three years. Two-thirds of all the buckwheat grown in the United States is produced in New York and Pennsylvania, less than 25,000 bushels are produced annually in Wisconsin. On account of the small amount grown in this state a large portion of the flour and buckwheat feeds are shipped in from other states. Buckwheat is such an important crop that is should receive due attention and the Department of Agronomy of the Wisconsin College of Agriculture will carry on experiments with it on the sandy lands of the state. Buckwheat will grow on lands that are low in nitrogen and produce a fairly good crop. In many instances where other crops have been killed by frost, excessive moisture, or insect enemies, the ground can be used for buckwheat, as this crop admits being sown as late as July 4th.

The usual time for sowing is from June 10th to July 10th, depending upon the condition of soil and climate.

Few varieties of buckwheat are grown, the common black, the Silver Hull and the Japanese are the varieties now chief-

ly used. The Japanese variety is finding considerable favor among the farmers on acount of its reliability in setting full crops of buckwheat in dry, hot weather, and the fact that it stands up better than the other varieties. The millers prefer the Silver Hull, as they claim a finer grade of flour can be made therefrom.

The ground should be prepared the same as for other cereal crops, and the buckwheat sown broadcast or with drill, using about three pecks of seed per acre.

Buckwheat can be cut with reaper or binder, but should be left in loose bundles to facilitate drying. It is customary to thresh buckwheat from the field after it has become well dried.

The average yield of the United States for 1905 was 19 and for Wisconsin 15 bushels per acre, but in many instances good fields of buckwheat will yield from thirty to forty bushels per acre.

The Blodgett Milling Company of Janesville in a recent communication to the College of Agriculture deplores the fact that so little attention is paid to this crop, while the demand and prices are gradually soaring upward.

The following communication was recently received from the above named company, which will be of interest to the members of the experiment association.

"Referring again to the matter that we suggested to you of stimulating the growing of buckwheat in Wisconsin, we beg to call your attention to the fact that practically all of the buckwheat grown in the United States during the last three or four years has been required in the domestic consumption of buckwheat flour. Before that there was more or less exported, but in the last few years the domestic requirements have kept the price above an export basis.

However, the working out of the national pure food law is going to at least double the demand for buckwheat grain. Outside of the product that reached the consumer in original mill packages, the greater part of the buckwheat flour consumed in the United States was blended to a greater or less extent with other products. Flour put out by the leading buckwheat mills in their own packages has been absolutely pure buckwheat, but we doubt very much whether the amount of absolutely pure buckwheat that reached the consumer amounted to over one-third of the total amount of so-called buckwheat flour consumed.

The Federal law requires that packages must be branded in accordance with their contents. This means that no flour can be branded 'Pure Buckwheat' except flour that which is absolutely pure buckwheat. If you, or anyone else, in making your daily purchases desire a sack of buckwheat flour, and the grocer offers you two sacks, one branded 'Pure' and the other 'Blended', we believe that in nine cases out of ten you, or anyone else, will take the 'Pure Buckwheat'.

If we size the situation up right the consumption of pure buckwheat flour will be very greatly increased the coming season. This will result in a shortage of buckwheat grain, for, as we have stated before, under the old conditions there has been no more than enough buckwheat grain to fill the domestic demand. Under the new conditions we believe that a shortage will exist and that prices will go rather high.

Even though the situation may not work out as we have predicted, yet the farmer can count on at least a price of one dollar and twenty cents per hundredweight, track shipping stations here in Wisconsin, as an average price. We brought into the state last year from Michigan over 100,000 bushels of buckwheat."

On account of the extent of sandy lands within our state, which produce buckwheat better than any other crop, and the ease with which it is grown, it seems that the time has come in Wisconsin agriculture when we should at least produce all the buckwheat needed in our state.

ROTATION OF CROPS.

On every Wisconsin farm attention should be paid to some good rotation of crops. By a proper rotation the farm is kept in good tilth, free from injurious insects and in a high state of fertility. In these days of close margins and high priced lands one must so conduct a farm as to get the most out of it. The farmer will get more returns by putting into practice a good rotation than from any other effort put forth on the farm.

The three essential fertility elements of the soil that the farmer has to consider above all other constitutents are, potash, phosphoric acid and nitrogen. The two elements first

named are fairly stable compounds, but nitrogen is hard to control. The nitrogen in barnyard manure if not properly protected is constantly leaching away or evaporating in the form of ammonia. The farmer who takes advantage of using leguminous crops in a proper rotation for the replenishing of his stock of nitrogen as well as the other elements is the one who in the end is highly successful.

A rotation that will admit of manuring the land at a time when the manuring is the most valuable, and at the same time enable us to get the greatest returns for the amount of manure distributed are factors that demand our strict attention. The size of the farm and the lines of agricultural effort emphasized will make our rotation vary to some extent. The four-year rotation for the farmer who has cultivated land and unbroken pasture land for his stock is an excellent one. If we have not followed a systematic rotation it will take two or three years before we can arrange to run the rotation properly. The four-year rotation admits of growing annually small cereals, corn, clover-hay and mixed hay.

The first year we will start with corn in the field on which we had grown mixed hay the previous year and the sod of which had been turned in the fall. The second year the corn field should be fall plowed, and the following spring well disked and prepared for small grain. Oats, barley or spring wheat, may be used the second year as a nurse crop for grasses and clovers, to which the land is seeded. Red clover should be the chief aim of the farmer to get established, consequently he should use in his grass mixture four or five quarts of red clover seed to the acre. Three quarts of timothy seed with the clover seed makes a good mixture. Blue grass and white clover usually grow without being placed in the grass mixture. Cereal crop harvested when ripe and new seeding pastured lightly if at all.

If conditions are favorable the third year two crops of clover may be cut; occasionally the second cutting of clover is retained for seed. The ground may be manured during the fall and winter and in early spring of fourth year a fine tooth harrow run over the field to spread evenly any lumpy manure that may be on the ground. If coarse manure had been used it may be well to run over with hay rake before using the drag to gather straw and coarse litter. The above method of applying manure will invariably insure a good cutting of mixed hay and at the same time the roots of the grasses will hold

near the surface the nitrogen from the manure and prevent the leaching that would have taken place if the manure had been distributed on stubble land. This field should be fall plowed, preferably late so as to destroy insect enemies that infest the sod; the following spring put into corn thus starting again the rotation.

By following this system of rotation a farmer has a portion of the farm to manure annually to the best advantage and respective divisions that will be into corn, small cereals, clover and mixed grasses. Where the desire is to pasture the fields that are in rotation for a full season an additional year can be added making the rotation five years, and having the farm laid out in five divisions instead of four.

Nothing works better than a good systematic rotation to reclaim poor and worn out soils and to keep good farms from being impoverished. Any farmer who rents his farm to another should have embodied in the lease a clause providing for the following of a good system of rotation in order to prevent soil robbery.

DIVISION OF FARM CROPS.

Plan of Work for the Coming Year.

R. A. MOORE.

I desire the energy of the Experiment Association concentrated on the corn and barley work the coming season. We are now at the threshold of success and any delay on our part would mean the losing of the vantage ground already obtained. The call from all over the country for seed grains grown by our Association leads me to see that the farmers are quick to perceive the importance of growing crops from select seeds instead of continuing the mongrel bred varieties. The favor so far obtained for select seed grains can only be continued by observing strict rules of honest practice.

If for any reason our seed crop should be damaged or contaminated with noxious weed seeds we should at once notify the Secretary and refrain from selling such seed. All seeds of questionable character should be fed on the farm or sold as feed grain, and not listed as seed grains.

Our work in establishing standard varieties of corn for Wisconsin should be continued and pushed with the utmost vigor. No longer should we encourage the scoop shovel method of supplying seed corn, but insist that the only true way of furnishing seed corn is in the ear. No seedsman can advance a single argument of value for not selling seed corn in the ear. Where shelled corn is supplied the farmer for seed, the danger of mixing and getting an inferor grade of seed is too great to be safely advocated. The only true way of preparing seed corn for market is to fire dry it and then store safely in a room for shipment. All seed corn should be shipped in the ear for which the grower should receive ample returns for his extra labor. By adhering strictly to the above principle, we will be able to throw new life and vigor into the corn plant and lead the world in production per acre. Ohio was the only state in America that led Wisconsin in yield of corn per acre in 1906.

Our experiments for the coming year are outlined in our last report and members of the association who desire carrying on these experiments can be governed by these outlines and will be furnished report blanks in due time for the purpose of reporting the experiments.

We should bear in mind that whatever experiment is undertaken the Secretary should have knowledge of the same so as to be able to compile the data for publication.

In my travels throughout the state, I frequently visit members of the association who are gowing and testing seed grains, but do not think it necessary to make a report. The value and importance of the work is lost entirely to others if we neglect so important a duty. In order to be placed on the seed grower's list one must notify the Secretary of the kind and amount of seed, the price per bushel, and any other data that may be well for the Secretary to know.

The grower of pure bred seed grains should be a business man in the strictest sense and should have business cards and letter heads for business correspondence. These cards and letter heads should be modest, giving the name of the farm, the owner's name, the seed grains grown, and any specialties

taken up by the owner. I feel that these things are too often neglected and we lose trade thereby. Give the dear old farm a name and keep it trimmed up so it will not have cause to blush with shame at an introduction to visitors. Let intensive application, integrity and fair dealing be your watchword, and no earthly power will prevent your success.

OUTLINE OF COOPERATIVE EXPERIMENTS.

Experiment 1.

Trials with Alfalfa to Determine if It Can be Grown in Wisconsin Successfully as a Forage Plant and the Relative Value of Soil Inoculation and Sowing with and without a Nurse Crop.

The value of alfalfa as a forage plant in the west is becoming more and more apparent and the area grown, which was small a few years ago, has gradually widened until at the present time most of the stock producing states west of the Mississippi grow it in abundance. In Wisconsin alfalfa is yet in the experimental stage and until it has been further tried at the Experiment Station and by members of the Experiment Association, it will be well for the farmers of the state to refrain from sowing large areas.

Alfalfa or lucerne is a perennial plant and belongs to the clover family. If not killed by frost, water or some other element, it can be cut the second year after sowing three or four times per season for hay, for many years without re-seeding.

It should be sown in the spring on land that is well drained. with oats or barley as a nurse crop, or alone if the land is not weedy, at the rate of twenty pounds of good seed per acre.

Having procured American alfalfa seed, proceed as follows: Select land that never overflows and that which is well drained and had grown a cultivated crop the previous season; the richer the soil the better will be the growth of the alfalfa. Fall plowing is preferable to spring plowing therefore, we should

select a piece that has been fall plowed if possible. Prepare the seed bed thoroughly and sow oats on half of the plot and cover as usual; then sow alfalfa broadcast at the rate of twenty pounds of seed per acre and drag once. It is wel to leave a fair growth as a cover crop for the winter, as like the clover, there is danger of its winter killing.

Do not pasture at all the first season and only sparingly thereafter as it injures the alfalfa plants.

By sowing the oats at the rate of one bushel per acre you will give the alfalfa a better chance to grow as the young alfalfa plants will not be crowded as they would be if the ordinary amount of oats was sown per acre. Barley sown three pecks to the acre is preferable to oats as a nurse crop.

After carefully preparing the seed bed, scatter bacteria-laden soil on a portion of the plot before sowing the seed. Mark distinctly that portion on which the soil is sown so as to determine the difference, if any, on that portion of the field where the soil is scattered and that which was not treated. Sow the bacteria-laden soil across one end of the plot so that it will cover ground where alfalfa is sown with and without a nurse crop.

REPORT BLANK, EXPERIMENT 1.

Getting a Stand of Alfalfa and Testing the Relative Value of Soil Inoculation and Sowing with and without a Nurse Crop.

Name of experimenter .....
P. O. .....; County.....; State.....

1. Date of sowing oats or barley and alfalfa.....
2. What variety of alfalfa used?.....
3. Nature of soil? .....
4. How prepared? .....
5. When were the alfalfa plants first noticeable?.....
6. Was the grain crop left to ripen?.....
7. Did you secure a good thick stand of alfalfa?.....
8. At what rate did you sow the alfalfa seed per acre?....

....

9. At what rate did you sow the oats or barley per acre?...
10. Which seems preferable sowing with or without a nurse crop? .....
11. Did you examine the roots of the plants on both sections of the field for bacteria-laden nodules?.....
12. Were any nodules found? .....
13. Were the nodules as plentiful on the roots of the plants growing on that portion of the field that was not inoculated as where the ground was scattered?...
14. Could you detect any difference in the growth of the alfalfa? .....
15. Date of making this report?.....
16. Give in a brief way your opinion on growing alfalfa in Wisconsin, and the benefit, if any, from the inoculation of the soil.

Experiment 1. A.

Alfalfa after First Year's Seeding.

Through the encouragement of the Experiment Association many of its membership sowed from one to two acres of alfalfa the past two years. The Association is desirous to learn the success of those who have sown alfalfa previous to this year and will send blanks and return envelope to any one who will agree to send in report.

REPORT BLANK, EXPERIMENT 1. A.

Report of Alfalfa after First Year's Seeding.

To be sent to the Secretary by October 1, 1907.

Name of experimenter .....
Post Office.....; County.....; State.....

1. Year and season alfalfa was sown.....
2. Was the alfalfa sown with or without nurse crop?.....
3. Variety of alfalfa seed used .....
4. Amount of seed per acre.....
5. Was crop cut for hay the year of sowing?
6. If so, the amount obtained per acre.....
7. Nature of the soil .....
(Clay, muck, highland, lowland, etc.)
8. Was good stand noticeable before the fall frosts?.....
9. What per cent, if any, winter killed?.....per cent.
10. How many cuttings did you get the year after seeding?..
11. Weight of hay from all cuttings for the season—
(actual) ..... (estimated) .....
12. Did you experience any difficulty in curing the crop for hay? .....
13. Did you use hay caps? .....
14. Did the plants develop the proper nodules on their roots? ....
15. Was the ground on which the alfalfa was sown inoculated with alfalfa or sweet clover soil?
16. Date of making this report .....

Please give in a brief way your method of growing alfalfa and your views as to its value as a forage plant for Wisconsin.

EXPERIMENT NO. 2.

Wisconsin Seed Corn—Ten Ear Test.

Little has been done in Wisconsin up to the present time in the way of breeding good seed corn or taking care of the season's crop.

We feel that by judicious selection of seed, farmers of the state can increase the yield from ten to twenty-five bushels per acre. We know that members of the Experiment Association

can do much good for the communities in which they reside by breeding a choice variety of corn. Due care must be exercised in planting, cultivating the soil, harvesting and curing the crop as well as rigid selection of the seed. No matter how good the seed if planted on weedy or poor worn-out soil and not properly cared for we could not expect a good crop.

We expect to see great strides made in the improvement of corn within the next few years and may not the Wisconsin Experiment Association be the factor to bring this improvement about?

Twenty-five ears of corn are given to each member who desires to assist in corn improvement only 10 ears of which will be used in the experiment proper. The corn from each ear is to be planted in a separate row.

Use the ear with the least number of kernels first. Plant in hills three and one-half feet apart in the row and the same distance between the rows. The corn left from the different ears after planting individual rows can be mixed with the corn shelled from the remaining 15 ears and planted in close proximity.

Plant at least forty rods from any other corn, a greater distance if convenient. Avoid having a field of corn near the west or south of the plot as the prevailing wind during the pollenizing season is from that direction and the corn is liable to cross.

REPORT BLANK, EXPERIMENT NO 2.

Wisconsin Seed Corn—Ten Ear Test.

Name of experimenter .....
P. O. .....; County .....; State .....

1. Variety of corn planted .....
2. Where was seed secured? .....
3. Germinating test per cent .....
4. Date of planting .....
5. Nature of soil .....
6. Fall or spring plowed .....
7. Following what crop? .....
8. How planted? .....
9. When first noticeable above ground? .....
10. Did corn germinate evenly? .....

11. Give number of times and method of cultivation?.....
12. Did corn mature well?.....
....
13. Total number of stalks in each row.....
14. Number of barren stalks in each row.....
15. How harvested? .....
16. Yield per acre, actual.....; estimated.....
17. Yield per acre any other variety, actual.....
estimated .....
18. Compare yield with home variety of corn if possible.
19. The yield should be determined on the shelled corn basis, two bushels of ears being considered one bushel of shelled corn.

REPORT BLANK.—EXPERIMENT NO. 2.

Wisconsin No. 7 Corn.

Name of experimenter .....
P. O. .....; County .....; State .....

1. Where was seed secured? .....
2. Germinating test, per cent .....Date of planting.....
3. Nature of soil .....
4. Fall or spring plowed? .....
5. Following what crop? .....
6. How planted? .....
7. When first noticeable above ground? .....
8. Did corn germinate evenly? .....
9. Give number of times and method of cultivation.....
....
10. Did corn mature well? .....
11. Did corn smut badly? Approximate amount of smut..
....
12. What per cent of barren stalks was noticeable?.....
To find per cent of barren stalks, count the whole number of barren and fruitful stalks present in a definite number of hills and divide the number representing the barren stalks by the number representing the whole number of stalks. Counts can be made in four or five places in the field and averaged.

13. How harvested? .....
14. How many acres harvested? .....
15. Yield per acre, actual.....; estimated.....
16. Yield per acre best other variety, actual.....
estimated .....
17. Compare yield with home variety of corn if possible. The yield should be determined on the shelled corn basis, two bushels of ears being considered one bushel of corn.
18. How many bushels of fire-dried corn in the ear will you have to sell for seed? .....

Give brief description of what you think of the No. 7 corn.

REPORT BLANK.—EXPERIMENT NO. *2.*

Wisconsin No. 8 Corn.

Name of experimenter .....
P. O. .....; County .....; State.....

1. Where was seed secured? .....
2. Germinating test, per cent..... Date of planting.....
3. Nature of soil? .....
4. Fall or spring plowed? .....
5. Following what crop? .....
6. How planted? .....
7. When first noticeable above ground? .....
8. Did corn germinate evenly? .....
9. Give number of times and method of cultivation.....
.....
10. Did corn mature well? .....
11. Did corn smut badly? Approximate amount of smut?..
.....
12. What per cent of barren stalks was noticeable? .....
To find the per cent of barren stalks, count the whole number of barren and fruitful stalks present in a definite number of hills and divide the number representing the barren stalks by number representing the whole number of stalks. Counts can be made in four or five places in the field and averaged.
13. How harvestel? .....

14. How many acres harvested? .....
15. Yield per acre, actual.....; estimated.....
16. Yield per acre best other variety, actual.....
estimated .....
17. Compare yield with home variety of corn if possible. The yield should be determined on the shelled corn basis, two bushels of ears being considered one bushel of corn.
18. How many bushels of fire-dried corn in the ear will you have to sell for seed? .....

Give brief description of what you think of the No. 8 corn.

Experiment No. 3.

Treating Potatoes with Formaldehyd Solution for the Prevention of Potato Scab.

The potato crop of Wisconsin in 1904 is estimated at 31,500,000 bushels, valued at approximately $9,000,000. Only a portion of the yield is retained, the remainder shipped to market, for which the farmers of Wisconsin receive a sum one-third as great as the value of the dairy products of the state. The potato industry has become so important that is needs our immediate attention.

One of the evils the grower has to contend with is the potato scab which often renders the crop of potatoes unfit for market, or nearly so. The market demands a smooth, even grade of potatoes; consequently, where the potatoes have been made rough by the scab fungus they sell at a reduced price. The scab fungus attaches itself to the tuber where it makes the ugly looking scabs so often found on the potato, or remains in the soil where it is able to survive varying conditions for several years.

The scab fungus on the seed potato can be killed readily by the formaldehyd treatment here recommended, and if the seed is then planted on land that has not before grown scabby potatoes or has not become contaminated with the scab fungus in any other way, the crop should be entirely free from scab.

Method of Treatment.—Put in a cask twenty gallons of water and pour in one pint of formaldehyd, and after stirring the solution, distribute in several barrels or tubs. Put in the uncut seed potatoes and submerge for two hours. If desired, the potatoes can be left in gunny sacks or bags while being treated.

After removing the potatoes from the solution they can be cut and planted as desired. In this test the experimenter will select a bushel of scabby potatoes and treat half and retain the other half without treatment. Plant on ground that has never before grown potatoes, and note the result.

Do not let the treated seed come in contact with the untreated seed or any sack which has held untreated potatoes. The seed potatoes for the general crop should all be treated if scabby.

REPORT BLANK, EXPERIMENT NO. 3.

Treating Potatoes for the Prevention of Scab.

Name of experimenter .....
P. O. ..... ; County ..... ; State .....

1. How much seed treated for the experiment? .....
2. How much seed untreated for the experiment? .....
3. Date of planting .....
4. Did you notice any characteristic difference in the growth of the potato vines during the growing period? ..
   ....
   ....
5. Date of digging potatoes .....
6. Yield from the seed treated .....
7. Yield from the seed not treated .....
8. No. of scabby potatoes found from the treated seed ....
9. No. of scabby potatoes found from the untreated seed ..

EXPERIMENT NO. 4.

Treating Seed Oats to Prevent Smut.

Smut affecting oats is prevalent in all parts of this and adjoining states. The great loss sustained by farmers and the rapid increase of the smut area suggests that a remedy be found to stop this loss.

Method of Treating Seed Oats for the Prevention of Smut. —The method that has proved to be the most effective during the past six years, and that now generally used by the farmers

of the state, is the formaldehyde method. If the desire is to treat one hundred bushels of seed oats, purchase at least four pints of formaldehyde from your druggist, and make up the solution by pouring one pint of the formaldehyde into thirty-six gallons of water. Put the solution in barrels or in a tank and submerge the sacks of seed oats in the solution at least ten minutes. Raise the sacks of oats from the solution and let them drain for a minute or two, in order to save solution, and then empty on a threshing floor, platform, or on a canvas to dry. Do not spread out immediately, but let the oats remain in a heap for two hours after treating. If the wet sacks or a canvas is spread over the pile of oats after treating it will prevent the rapid escape of the formaldehyde gas and make the treatment more effective. After the expiration of two or three hours the oats should be spread out and shoveled over at intervals, to facilitate drying.

It is the desire of the Association to know the effectiveness of this treatment by many observers, and to publish determinations in the next annual report.

Where smut has been noticeable in the oats the previous year all seed should be treated to prevent a re-occurrence.

For the following experiment it will be necessary to treat about three bushels, sufficient to sow an acre, in accordance with plan outlined in its instructions.

Experiment.—1. Take three bushels, or the usual allowance for seeding one acre, that were threshed from a field that was worse affected with smut the past season, and treat as stated in directions.

If the experimenter has no oats, he probably can obtain some from a neighbor whose grain has been afflicted with oat smut.

2. Take the same quantity from the same lot of oats and do not treat.

3. Sow both quantities on adjoining plots of one acre each. Be sure to have a distinct separation from the plot sown with the oats treated and that on which the oats are not treated.

4. After the oats are headed take an ordinary barrel hoop and make several counts on the plot where oats were treated and on the plot where oats were not treated. This can be done by placing a hoop over the oats and counting all the heads within the circle and then note the number affected with smut thus getting data to determine the percentage.

REPORT BLANK, EXPERIMENT NO. 4

Treating Seed Oats to Prevent Smut.

Name of experimenter .....
P. O.,.....; County .....; State.....

1. Did you treat oats according to directions?.....
2. How much treated for the experiment? .....
   Size of plot .....
3. How much was sown on experiment that was not treated?
   Size of plot.....
4. Did you treat your seed that was sown for general purposes? ....
   1. Date of sowing seed not treated.....
   2. Date when smut was first noticeable.....
   3. When were oats cut? .....
   1. Date of sowing seed treated .....
   2. Date when smut was first noticeable .....
   3. When were oats cut? .....
5. Did you make several counts after the oats were headed using the hoop in the manner suggested?.....
6. What per cent. of oats were affected with smut on plot where seed was treated to prevent smut?.....
7. What per cent. of oats were affected on plot where seed was not treated?.....
8. Per cent. saved by treatment .....

The data obtained by counting the heads within the circle of a hoop that are affected and those not affected is a fairly accurate method of arriving at the percentage of oats affected with smut.

EXPERIMENT NO. 5.

Tests With Swedish Select Oats.

The Swedish Select oats (Wis. No. 4) through several years' tests have proven to be satisfactory and especially adapted for Wisconsin conditions. The desire is now to have them grown as extensively as possible by members of the Association so that the variety will be in reach of all farmers.

In order to be placed on the list of seed growers it will be necessary to comply with certain conditions:

1. All seed oats must be treated for the prevention of smut previous to sowing.
2. Must be sown on land that is free from Canada thistles, mustard or quack grass.
3. If possible a comparison with another variety of oats should be made.
4. A report must be sent to the Secretary immediately after threshing.

REPORT BLANK, EXPERIMENT NO. 5.

Swedish Select Oats.

Name of experimenter .....
P. O.,.....; County .....; State.....

1. Date of sowing .....
2. Amount of seed sown .....
3. Amount of land covered (approximately) .....
4. Nature of soil? .....
5. Fall or spring plowed?.....
6. Sown with seeder or drill? .....
7. Were heads of any other grain noticeable within the plot on which oats were sown? .....
8. Were they removed? .....
9. Did the oats stand up well? .....
10. Did you treat the seed for the prevention of smut?.....
11. Did you notice any smut? .....
12. How much? .....
13. Was the ground on which oats were sown free from Canada thistles, mustard and quack grass? .....
14. Did oats rust? .....
15. When were oats cut? .....
16. Yield per acre of Swedish Select oats.....
17. Yield per acre of any other variety of oats grown.....
18. How many of the Swedish oats on hand do you intend to sell for seed oats? .....
19. Please give a brief description of what you think of the Swedish Select oats.

Experiment No. 6.

Test with Oderbrucker Barley.

(Wis. No. 55.)

In 1898 the Wisconsin Experiment Station received from the Ontario Agricultural College five pounds of barley known as the Oderbrucker. This barley had been obtained from Germany and grown several years on the college farm at Guelph, previous to being secured by the Wisconsin Station.

For eight years this barley has been grown on experiment in comparison with twenty-five other varieties and improved by selection until we feel confident that it is worthy of dissemination. The Oderbrucker barley is a stiff-strawed, heavy yielding, six-rowed, bearded variety, and is the most satisfactory barley from all points of view grown on the Station Farm. From malting tests made by the Wahl-Henius Institute of Fermentology, Chicago, the Oderbrucker barley compares favorably with all other barleys on test for malting purposes. It is a high protein barley, containing fifteen per cent of that element which makes it a good feeding barley.

At the present time Wisconsin farmers are growing many scrub breeds and types of barley which should be discarded. The Experiment Station with the aid of our asociation is desirous of getting pure bred grains of the best breeding into the hands of the general farmer at the earliest possible moment. Five hundred bushels of this high grade barley has been given to two hundred and fifty members of the Experiment Association and acre tests will be made in every county of Wisconsin. Members carrying on the experiments are requested to report as soon as the tests are completed. Blanks for making the reports will be sent by the Secretary in due time for the report.

Report Blank, Experiment No. 6.

Oderbrucker Barley.

(Wis. No. 55.)

Name of experimenter .....

P. O. .....; County .....; State .....

1. Date of sowing .....

2. Amount of seed sown .....
3. Amount of ground covered (approximately) .....
   (As near as possible try and cover one acre with seed obtained).
4. Nature of soil? .....
5. Fall or spring plowed? .....
6. Sown with drill or seeder? .....
7. Following what crop in rotation .....
8. Were heads of any other grain noticeable within the plot on which barley was sown? .....
9. Were they removed? .....
10. Did the barley stand up well? .....
11. Was the ground on which the barley was sown free from Canada thistles, mustard and quack grass? .....
12. Did the barley rust? .....
13. Was any smut noticeable? .....
14. When was barley cut? .....
15. Yield per acre of Oderbrucker .....
16. Yield per acre of any other variety of barley grown....
17. May we put you on the seed growers' list? .....
18. Please give a brief description of what you think of the Oderbrucker barley, Wisconsin No. 55.

Experiment No. 7.

Tests With Forage Rape.

For several years rape has been grown for soiling purposes on the Experiment Farm with that degree of success which suggests that it is worthy of a trial by Wisconsin farmers in general.

Sheep and young stock are fond of the plant and fatten readily when pastured upon it. Care should be taken to not let sheep feed upon it while the plants are wet with dew, or when the sheep have been kept for several hours without food as they then eat so abundantly that it often leads to serious bloating or scouring.

The Variety Used.—The Dwarf-Essex rape has been the variety used most extensively at the Experiment Farm. This variety can be purchased from any good seed house, in five or ten pound lots for about eight cents per pound, and for considerable less in large quantities.

Rape can be grown late as well as early in the year, therefore, it often serves as a good catch crop when other crops have failed, and will afford a goodly supply of green fodder when the pastures are dry and short. If possible, try four experiments with rape.

A. Sow broadcast on one acre or more which you have previously seeded to oats and which are about one inch in height at the time of sowing the rape. Cover with slant tooth harrow or light drag which will not materially injure the oats. Let the oats ripen and when cut, the rape will come on rapidly and cover the stubble with its wide spreading leaves. It feeds to best advantage when about 18 inches in height or a little over. If hurdle fence is used and changed from time to time, the rape eaten will come on rapidly and soon be fit to pasture again.

B. Sow one acre or more which has been properly prepared with disk harrow or otherwise, to rape, using drill and putting the seed in about 30 inches apart between the rows so as to cultivate once or twice.

C. Sow one acre or more broadcast or with the drill at the time of sowing oats. The rape seed should be mixed with the oats. If the ground is not too rich the rape will not interfere with the oat crop or lessen the yield to any great extent. After harvesting oats, rape will come on rapidly and in a few weeks be of sufficient height to pasture. If sown on rich ground in a wet season the rape will interfere with the grain crop.

D. Sow one acre or more broadcast, without dragging, when oat crop is from two to four inches in height. Sow about four pounds of rape seed per acre, and if possible, before or immediately after a shower. This method is especially recommended on low rich soils.

Amount of Seed Necessary.—When sown in drills, three pounds per acre is sufficient, when broadcast, on small areas, five or six pounds should be used; when sown with oats at the time of seeding use about one pound per acre mixed with the seed oats.

By reserving ten feet square or one square rod and cutting rape when about eighteen inches or two feet in height, then weighing, the amount of green fodder per acre can be readily determined.

Rape should be cut about four inches from the ground in order to get the best results for next crop.

If season is favorable you will succeed in getting three cuttings of rape from the same plot if it is sown early and alone.

Where the object is to fatten sheep for the market, a small grain ration should be fed at regular intervals.

REPORT BLANK, EXPERIMENT NO. 7. A.

Sowing Rape Broadcast on Oat Field and Dragging Ten or Twelve Days after Seeding with Oats.

Name of experimenter .....
P. O. .....; County .....; State .....

1. Date of sowing oats .....
2. Date of sowing rape .....
3. What variety of rape used? .....
4. Amount of seed used per acre .....
5. Nature of soil? .....
6. How prepared? .....
7. What height were the oats when rape was sown? .....
8. Did dragging materially injure the oat crop from first observation? .....
9. When were rape plants first noticeable? .....
10. When were the oats cut? .....
11. How did the yield of oats compare with the yield on land where no rape was seeded? .....
12. How long after oats were cut before rape was fit for feeding purposes? .....
13. How many and what kind of animals did you pasture upon the rape? .....
14. Did you feed a grain ration also? .....
15. Did animals fed upon rape thrive? .....
16. Were the rape plants affected by any insect enemies or fungus disease? .....
17. Approximately, how much green fodder did the rape produce per acre? .....
18. Did you notice any detrimental effects from the feeding of rape? .....
19. Briefly give your opinion as to the value of rape as a soiling crop .....

REPORT BLANK, EXPERIMENT NO. 7. B.

Sowing Rape with Drill.

Name of experimenter .....
P. O. .....; County .....; State .....

1. Date of sowing .....
2. What variety? .....
3. Width between rows? .....
4. Amount of seed used per acre? .....
5. Nature of soil? .....
6. How prepared? .....
7. How long after sowing was rape fit for feeding purposes?
8. How many and what kind of animals did you pasture upon rape? .....
9. Did you feed a grain ration also? .....
10. Did animals fed upon rape thrive? .....
11. Approximately, how much green fodder did the rape produce per acre? .....
12. Did you notice any detrimental effects from the feeding of rape? .....
13. Briefly give your opinion as to the value of rape as a soiling crop .....

REPORT BLANK, EXPERIMENT NO. 7. C.

Sowing Rape on Plot with Oats in Accordance with Directions Given on Information Sheet.

Name of experimenter .....
P. O. .....; County .....; State .....

1. Date of sowing .....
2. What variety of rape used? .....
3. Nature of soil? .....
4. Amount of seed used per acre? .....
5. How prepared? .....
6. When were the rape plants first noticeable? .....
7. When were the oats cut? .....
8. Did the rape interfere in any way with the growth of the oats? .....

9. Did you experience any difficulty in cutting and binding oats on plot where rape was sown? .....
10. Did the rape interfere with the drying out of the bundles?
11. How long after oats were cut before rape was fit for feeding? .....

Which, in your opinion, is preferable, sowing the rape at the time of sowing oats or after the oats have reached the height of one or two inches? .....

REPORT BLANK, EXPERIMENT NO. 7. D.

Rape Sown Broadcast without Dragging, When Oat Crop is from 2 to 4 Inches in Height; Immediately Before or after a Shower.

Name of experimenter .....
P. O. .....; County .....; State .....

1. Date of sowing oats .....
2. Date of sowing rape .....
3. What variety of rape used? .....
4. Amount of seed used per acre? .....
5. Nature of soil? .....
6. How prepared? .....
7. Did you sow rape seed immediately before or after a shower? .....
8. When were the rape plants first noticeable? .....
9. When were the oats cut? .....
10. How did the yield of oats compare with the yield on land where no rape was seeded? .....
11. How long after oats were cut before rape was fit for feeding purposes? .....
12. How many and what kind of animals did you pasture upon the rape? .....
13. Did you feed a grain ration also? .....
14. Did the animals fed upon the rape thrive? .....
15. Approximately, how much green fodder did the rape produce per acre? .....
16. Did you notice any detrimental effects from the feeding of rape? .....
17. Briefly give your opinion as to the value of rape as a soiling crop .....

Experiment No. 8.

Soy Beans.

The soy bean was probably introduced into the United States from Japan about fifty years ago and has been cultivated with success in the southern states. In Japan it is used extensively as a human food, but in this country it is grown for the seed, as a forage plant, and as a soil renovator. As a forage its use as a soiling crop is becoming recognized, by stockmen and dairymen, as it withstands the drought exceptionally well and will give a good cutting of green forage at the time when other feeds are shriveled and wilted. Soy beans of the late variety gave a cutting of 9.9 tons green forage per acre at the Wisconsin Experiment Farm in 1900 and yielded thirty-eight bushels of seed beans per acre in 1902, and forty bushels per acre in 1903. It makes an excellent hay, and at the Kansas Station a yield of about three tons of cured hay per acre was secured.

Like the clover, the soy bean is a nitrogen gatherer and enriches the soil on which it is grown. It is said to grow on soil quite low in fertility, but a mellow, fairly rich soil is preferable. It requires a well drained porous soil; in no case should the seed be sown on low ground that is saturated with water during most of the growing period or on a heavy clay soil that is inclined to bake.

When sown for hay or a soiling crop, a drill or broadcast seeder can be used to advantage. If sown for seed, use a corn or bean planter and sow in drills about thirty inches apart and about three inches apart in the drill. When planted in drills as described, from two or three pecks of seed per acre should be used.

Soy beans should not be planted while the ground is cold; immediately after corn planting is a favorable time.

Sow in accordance with suggestions above given, for growing soy beans for seed, one-tenth of an acre.

When desired for hay, soy beans should be cut when the pods are partly developed. Try a few square rods sown broadcast for a soiling crop and for hay. When grown for seed they should be harvested and threshed as our common variety of beans and put in a large open bin and shoveled over frequently to prevent heating.

If you have a silo try soy beans with corn. Plant in drills

with the corn planter using one-third soy beans and two-thirds corn mixed. When planting with corn for the silo use the Medium Green variety as this variety is noted for its great leaf development. No difficulty will be experienced cutting the soy beans with the corn harvester at the time of harvesting corn. For pasture, hay or seed the Ito San variety will give excellent satisfaction and will usually ripen before the fall frosts.

Secure a sack of inoculated soil from the Experiment Station and scatter on a portion of the field that you desire to plant to soy beans, and note the development of nodules. The roots of the soy bean plants growing on that part of the field add much fertility to the soil. When a few square rods of ground are inoculated and soy beans are grown thereon, henceforth ground can always be secured from this source of supply to scatter on other fields where the desire is to have the nodules develop.

REPORT BLANK, EXPERIMENT NO. 8.

Soy Beans.

Name of experimenter .....
P. O. .....; County .....; State .....

1. Date of planting soy beans .....
2. Character of soil .....
3. What crop had been grown the previous year? .....
4. Was the land used, fall or spring plowed? .....
5. Give your method of planting .....
6. How long after planting were beans first noticeable? .....
7. Give your method of cultivation .....
8. Did you try a few square rods for forage? .....
9. How many pounds of green forage did you cut from a square rod? .....
10. How many pounds of cured hay did you get from a square rod? .....
11. Did the stock eat the green and cured forage readily? ..
12. What kind of stock did you feed it to? .....
13. Did the beans left for seed ripen evenly? .....
14. Date of harvesting? .....
15. Manner of harvesting .....

16. Method of threshing.....
17. Yield per acre of marketable beans .....
18. Did you use any bacteria-laden soil for inoculation purposes? .....
19. Were nodules noticeable on the roots of the soy beans at any time during the growing period where such soil was used? .....
20. Were they noticeable where the soil was not used? .....
21. Date of sending report .....
22. Give in a general way your opinion of soy beans as a seed and forage plant for Wisconsin .....

Experiment No. 9.

Barley Smut.

I am anxious to have a test for the eradication of barley smut made by members of the Experiment Association. For several years we have labored to find out an effectual remedy and it was not until last year that we succeeded.

The treatment is simply this. Soak sack of barley twelve hours in cold water, let drain for one hour,—put in cask of warm water, not over 130° F., for a minute or two to take off chill and then submerge in barrel of warm water held at constant temperature of 130° F. for five minutes. After removing sack of barley, empty on threshing floor to cool, and sow as soon as posible thereafter. If left for two or three days before sowing, barley will sprout. Use gunny sacks in which to put barley for treatment and do not have them more than half filled as this will allow the penetration of the temperature readily.

For the experiment use the barley secured from the Wisconsin Experiment Association this year or some of the product of that you secured last year. Treat one bushel in accordancee with above directions and sow one bushel without treatment. You can also treat as much as you desire of your general crop that does not go into the experiment.

When the barley is beginning to head make tests for smut. Make one test as soon as barley is headed, and the other a little later in the season and average the results.

To make tests use hoop or square that will enclose about four square feet. Throw or place hoop over heads of barley in a spot not previously selected by the operator; count all heads

within the hoop, smutted and not smutted, then count merely the smutted heads and divide this number decimally by the total number of heads within the hoop which will give the per cent of smut.

A report blank will accompany the outline for the experiment to enable you to determine in advance approximately what data are desired.

REPORT BLANK, EXPERIMENT NO. 9.

Barley Smut.

Name of experimenter .....
P. O. .....; County .....; State .....
1. Did you treat barley according to directions? .....
2. How much treated for experiment? .....
Size of plot .....
3. How much sown on experiment the seed of which was not treated? .....
Size of plot .....
4. Did you treat your seed that was sown for general purposes? .....
(a) How much treated? .....
(b) How much not treated? .....
5. What were the results on the treatment of the general crop? .....
(a) Per cent of smut from untreated seed? .....
(b) Per cent of smut from treated seed? .....
6. Date of sowing treated barley on experiment .....
Date when plants first appeared above ground.....
7. Date of sowing barley that was not treated.....
Date when plants first appeared above ground .....
8. How many tests were made for smut? .....
9. What per cent of barley was affected with smut on plot the seed of which was not treated? .....
10. What per cent of barley was affected with smut on plot the seed of which was treated? .....
11. Per cent saved by treatment.....

Give a brief description of what you think of the barley smut treatment.

Send in report as soon as the experiment is completed.

THE WISCONSIN OAT CROP.

In many portions of our state the grain rusts have become so prevalent that the amount of damage done by them can scarcely be estimated.

Scientists have thus far been unable to discover any remedy for this fungous growth. In order to gain some idea of the nature and extent of these rust attacks throughout the state, and to determine if possible to what extent they affect the quality and quantity of grain grown, I am enclosing you herewith a report sheet. As we are particularly interested in oats at this time, the questions on this sheet are confined wholly to them.

You will note that the questions require observations to be made this fall and winter as well as the coming spring and summer. I ask your hearty co-operation in obtaining the information called for It is to the interest of every farmer in the state to know, approximately at least, how much he is losing every year from the attacks of fungous diseases. I am anxious, therefore, to know to what degree rust develops on oats in your locality. This can be determined by observation of the diseased plants themselves and by comparison of the yields with those in portions of the state with similar soil, but where rust does not appear. Hence, I ask you to try and secure from as many farmers as possible, their opinion as to the percent of crop injured by rust and the average yield of grain per acre. Try to get a careful estimate, if possible.

The careful conducting of these investigations and the preservation of the reports until the first of June, 1907, when they should be returned to the office, will necessitate some inconvenience on your part. I trust, however, that your interest in the improvement of grain production in the state will influence you in carrying these investigations through to a successful conclusion.

Make careful observations throughout the season so that if a report is requested for another year the facts will be available.

THE WISCONSIN OAT CROP.

Name of experimenter .....

P. O. .....; County .....; State .....

1. What is the average number of acres of oats grown by the farmers in your neighborhood?
2. What is the average yield per acre?.....
3. What variety of oats do you grow?.....
4. What kind of soil have you?.....
5. What influences, such as rust, smut, and insects, most seriously affected the oat crop in your part of the state? .....
6. If rust is prevalent, at what date in the spring or summer does it first appear? .....
7. Have you ever noticed rust on grasses anywhere on the farm but especially near oat fields?.....
8. What is your estimate as to the per cent of crop lost through attacks of rust?.....
9. Are self sown oats common in the fall?.....
10. If so, are they ever rusty?.....
11. Do the plants ever survive the winter?.....
12. If not, what is the latest date at which they may be found? .....

    Month....., Day.....
13. If any plants survive the winter can rust be found on them in the spring? .....
14. If rust can be found on self sown oat plants at any time during the winter take note of date and send sample to A. L. Stone, Madison, Wisconsin, for examination.

DIVISION OF BACTERIOLOGY

H. L. RUSSELL.

BOVINE TUBERCULOSIS IN WISCONSIN.

The economic importance of this subject is such as to demand the attention of every stock raiser in this state. The disease of tuberculosis is unquestionably the most important stock disease with which we have to contend with today, and its rapid spread in recent years, not only in cattle, more particularly with swine, makes it absolutely necessary that the stock owner should give the utmost attention to his herd. Tuberculosis is spread among stock generally in one or two ways. First, by the purchase of animals affected in the early unrecognized stages of the disease;—second, through the medium of infected factory by-products, skim milk, whey, etc., where the same have been contaminated with tubercular organisms from affected animals. In this state at the present time the first method of spread is by far the most important. Several instances have come to our attention where the disease has been widely disseminated in localized communities through the infection of factory by-products but the most common method of introduction of the disease into the herd is through the purchase of animals from outside sources.

This may come about either through the attempt to improve the quality of the herd by bringing into the same, pure bred sires or cows, or it may come from the general sale of grade or common stock. While the improvement of our cattle has been entirely brought about by the introduction of improved animals from outside sources, this has also been the means of introducing into our common herds this disease.

Our records that have been accumulated during the last year or so, show about one hundred fifty instances of where the disease has originated in a herd by the purchase of animals from outside sources. You can therefore see the absolute necessity of knowing beyond all question the actual condition of the ani-

mals that are brought into the herd as to whether they are free of the disease or not.

The only way that the actual condition of these animals can be determined with certainty is to apply the tuberculin test. The disease of tuberculosis is one that is exceedingly insidious in its development and consequently cannot be recognized in the early stages, even by the most skilled expert. Animals that are in good flesh, with soft pliable skin and apparently in the best of health may be suffering from this disease. The actual condition of these animals can only be recognized by post-mortem examination.

The introduction, however, of what is known as the tuberculin test affords an opportunity for the early recognition of the disease and is of the greatest possible help to the stock owner as to the determination of the actual condition of his herd.

The tuberculin test can be applied to stock so readily that all stock owners should be thoroughly posted as to the nature of this agent, and how it can be used. While it has been customary to have this test applied in the past by veterinarians, our experience for several years has led us to see the necessity of a much more wide spread introduction of the test among the herds of the actual stock raisers than seems possible at the present time if its use is confined exclusively to the veterinary profession.

It would of course be unwise for persons not having any experience to carry on the test without any sort of supervision or control. The method which has been in progress for the past several years under the auspices of the Experiment Station has proven so successful that we believe that it can be used by a large percentage of the stock owners of our state. This method is essentially as follows:

The stock owner himself or some other person who has been given special training at the Short Course or Farmers' Course at the University or by special correspondence can carry on the details of applying the test to his own herd. Full and explicit directions can be given the owner which will aid him after a little experience to make this test in a satisfactory manner as far as the application is concerned. The temperature records which are secured by him in this work are then submitted to the Department of Bacteriology at the Experiment Station for supervision and interpretation and the owner is advised as to the results of the test after the consideration of this data. This work is carried on in close conjunction with the State Live Stock Sanitary Board and arrangements have been

made for the disposal of the animals which react to the tuberculin test. Each test is considered on the basis of its own intrinsic merits and if properly performed and reacting animals found therein, the State Veterinarian is notified and a disposal of these animals is carried on by him, he reserving the right to accept or reject the results of the test on the basis of the test sheets submitted. In this way owners can determine for themselves the actual condition of their herds and can take such steps to eradicate the disease from their midst as will result in a minimum loss to themselves.

For the benefit of those who are not familiar with the conditions under which the animals may be disposed of by the State Live Stock Sanitary Board, the following data are submitted:

Either one of three methods may be followed in the disposal of the animals which may be found to react in the tuberculin test.

First. Animals adjudged tuberculous on the basis of the tuberculin test are appraised by three independent appraisors appointed by the Justice of Peace from the community in which the case occurs, the appraisal in no case exceeding fifty dollars for each animal. The reacting animals are then turned over to the state for disposal and the owner receives two-thirds of the appraised valuation. The state takes charge of the disposal of these animals which may be at its option slaughtered on the farm or shipped to packing centers where they are killed under federal inspection.

Second. In case the owner does not accept the option of receiving two-thirds of the appraised valuation from the state he may if he prefers ship these animals himself under the name of the State Live Stock Sanitary Board to the packing centers where they are killed under federal inspection. In this case he receives the full net value of the carcass. This method is preferable where the animals are apparently affected in the early stages and the disease is not sufficiently advanced to warrant the condemnation of the carcass by the federal authorities.

In the case of beef animals which pass federal inspection the value of the meat would frequently be much more than could be secured on the basis of the first option which could only give the owner the maximum of two-thirds of fifty dollars or thirty-three and one-third dollars.

Third. In the case of valuable animals that are apparently affected in the early stages it may be preferable to hold such

animals for a period of time in quarantine so as to secure healthy calves from the same. Experience has demonstrated that this can be done almost without exception and in the case of pure bred animals of extra quality, it is desirable to isolate the reacting animals and use them a time at least. In case this is done the animals are placed in quarantine by the Live Stock Sanitary Board and must be cared for in accordance with the rules and regulations of this Board, which simply looks to the prevention of the spread of the disease.

A large number of the members of the Experiment Association have already taken up his matter and tested their own herds and in many instances the herds of their neighbors. As members of the Short Course in Agriculture all of you have had extended instruction along this line by teaching as well as by demonstration, and you are in position to take up this work and carry it on very much better than the average farmer, who has had no experience in this matter. It is therefore, incumbent on you as progressive young men in your respective localities to do what you can to help in the matter of the eradication of this scourge. In doing this it is first preferable of course for you to make the test upon your own herd so as to show by your example that you thoroughly believe in the principles of the matter. After this is done it may be possible for you to take up the testing of animals in your vicinity. In a number of instances students have tested as high as one thousand head of stock. You can see at once what a potent influence your association can exert in educating the agricultural communities in this matter.

There is here inserted a blank form of application for tuberculin also a copy of the report blanks that are made out by the party in making a test upon his herd and a summary description of the tuberculin test and the manner of its application.

APPLICATION FOR TUBERCULIN.

Application is hereby made for.....doses of tuberculin for testing.....head of mature animals and.....head of young stock on the farm of..... of....., Wisconsin.

No charge will be made for this tuberculin, provided the owner of the herd and the person making the test agrees to the following conditions:

1. The test shall be made within thirty days after the re-

ceipt of the tuberculin and the temperature records, made out on blanks furnished, sent at once to H. L. Russell, Experiment Station, Madison, Wis., who will report to the owner the results of the test.

2. In case any tuberculous animals are found in the herd, the owner agrees to remove them at once from the healthy portion of the herd, so as to prevent further spread of the disease, and not to sell them to any person except for immediate slaughter. Reacting animals may be disposed of by the state under the rules of the Live Stock Sanitary Board. Address Secretary, Madison, Wis.

3. In case tuberculous animals are found in the herd, the owner agrees to thoroughly disinfect the stables occupied by the herd.

In making application for tuberculin, state whether you suspect the presence of the disease in your herd.

If so, what reason have you for such suspicions?

(Signed) .....,
Owner of herd.

(Signed) .....,
Person making test.

THE TUBERCULIN TEST AND ITS MANNER OF APPLICATION.

Tuberculin is a product of the growth of the tubercle organism in artificial cultures. In its preparation it is so treated as to destroy the vitality of all organisms and is a perfectly harmless product when used as directed. It does not injure a healthy animal, nor will it cause the disease to spread in a tuberculous animal. The value of this agent in determining the presence of tuberculosis is now undisputed. When used with ordinary judgment, the errors are only a few per cent, and in skilled hands it is almost infallible. In Pennsylvania, 4,000 animals that had given characteristic reactions were slaughtered and examined, and the presence of the disease was demonstrated in all but eight animals.

The test is very simple in its application and requires no especial technical skill. The introduction of the tuberculin causes a temporary fever in affected animals. The test consists in making a simple hypodermic injection and in taking a series of temperatures. Anyone who is familiar with the handling of cattle can make a successful test, if the details which are mentioned in describing the method of procedure are carefully observed.

Time to Apply the Test.—The most advantageous time to apply the test is during those seasons in which the animals are stabled. During the summer the animals become restless if kept in the stable during the day, and in very hot weather the normal temperatures may be so high as to lead to erroneous results.

What Animals not to Test.—As a rule animals should not be tested within four or five days before or after calving, nor while in "heat." These normal functions usually do not cause any marked changes in temperature, but in some cases, they may; and in order to be certain, it is well to exclude such animals from the test. Animals suffering from any disease (fever, garget, etc.) should be excluded. Animals which show a temperature of 103.5° to 104° F. should not be injected. As a rule calves less than three months old should not be tested.

The Temperatures of Cattle.—In cattle the normal daily temperature varies considerably, often 1-2° F. in the course of a few hours. A number of factors may produce such changes. Cold water when drunk in considerable quantities may reduce the temperature several degrees. A temporary excitement may cause a rise; excessive summer heat also increases the normal temperature. This is especially true where animals are kept in the stable in the summer. The average normal temperature of milch cows generally runs from 101° to 102.5° F.

Treatment of Animals During the Test.—On account of the ease with which these variations in temperature are caused, it is important to keep the animals that are being tested in as nearly a normal condition as possible. They should be fed as usual. The animals should not be allowed free access to cold water during the period in which temperatures are being taken. Water can be given in moderate amounts, preferably in the stable, and at such times as will least influence the temperature of the animals.

The Testing Outfit.—A hypodermic syringe of at least 5cc. capacity is needed. The same should be provided with a number of stout needles, which should be kept in good condition by sharpening on an oil stone. At least two clinical or fever thermometers will be needed, and where more than five animals are to be tested a larger number should be provided. In order to prevent breakage of thermometers some device should be used to fasten the same to the animal. A string may be tied around the thermometer at the constriction just above the

bulb and again near the top. This is attached to a small "bull dog" clamp, procurable at almost any stationery store. After inserting the thermometer, the clamp is fastened to the long hairs at the base of the tail. If the thermometer is then thrown out of the rectum, it will not be broken by dropping onto the floor.

MAKING THE TEST.

The test is divided into three parts. 1, taking the normal temperatures before injection; 2, the injection of the tuberculin; 3, taking of temperatures after injection.

Normal Temperatures.—During the day preceding the injection, at intervals of two or three hours, take a series of four or five temperature readings on each animal.

Injection of Tuberculin.—The injection should be made in the evening of the day on which the normal temperatures have been taken (8—10 P. M.).

Temperatures after Injection.—Eight to ten hours after the injection of the tuberculin, temperature readings should be begun. These readings should be taken every two hours until at least five have been made. Where animals show a marked rise, it is well to take readings more frequently and temperature observations should be continued on these until a permanent decline toward the normal is noted.

Taking the Temperatures.—The thermometers used are self-registering, i. e., the mercury remains at the highest point reached until shaken down by the operator. Shake the column of mercury down until it is below 99° F. Always read the thermometer before inserting to see that it is properly shaken down. Smear the end of the bulb with a little vaseline and insert thermometer full length in rectum. Do not push with much force, and use care in inserting the instrument. After three minutes, remove, read, record, shake down the mercury, below 99° F. and insert in the next animal. Familiarize yourself especially in the matter of reading the thermometer and if any trouble is experienced, ask your druggist or doctor to show you how.

Dose of Tuberculin.—The tuberculin furnished by the Experiment Station is supplied by the United States Department of Agriculture and is in such a concentration that a proper dose consists of 2cc. per 1,000 pounds estimated live weight. Proportionate doses are used for larger or smaller animals,

Moderate variations in the dose will have no injurious effect. One cubic centimeter (cc.) equals ¼ dram, or 15 drops. Ordinary hypodermic syringes are generally graduated in drams or cubic centimeters.

Making the Injection.—The injection is usually made in front of the shoulder where the skin is thin and loose, but can be made elsewhere. The syringe should be sterilized by placing in cold water in a basin and gradually bringing the water to a boil. Fill the syringe through the needle from the bottle of tuberculin. The needle can be inserted through the skin while on the syringe. Beginners will have less trouble, however, if the needle is inserted and the syringe attached later. A fold of the skin is made with the left hand, and the needle inserted in the pocket thus formed. Push the needle through the skin, but be careful not to force the same into the flesh. The secret of success in injecting is to have stout *sharp* needles.

INTERPRETATION OF THE TEST.

Animals which are affected with tuberculosis, even in the incipient stages, will begin to show a rise in temperature from 8 to 14 hours after injection. If the maximum temperature after injection is approximately 2°—2.5° F. or more above the average normal temperature, and the fever persists for some hours, the animal is tuberculous. Some consider a rise of 1.5° F. above the normal maximum as sufficient to indicate a positive reaction. Usually the reaction fever is much more marked, the temperatures rising from 3° to 5°. When the temperature reaches 104° F., or above, and is maintained for some hours, the animal is usually regarded as tubercular, if no fever was shown before injection. Sudden elevations of temperature that are not continued for some hours should not be looked upon as reactions. When the temperature rises only 2° or a little less above the average normal temperature the case should be regarded as "suspicious." Such animals should be retested in the course of 6—8 weeks, but not before as there must be time for the elimination of the first tuberculin from the system. Experience and a knowledge of all conditions that may have an influence on the temperatures are necessary in making a correct interpretation. Where tuberculin is sent out by the Station, the temperature record sheets are to be returned to the writers as soon as the test is completed and an interpretation of the results, with recommendations as to disposal will be made.

DISPOSAL OF TUBERCULOUS ANIMALS.

As soon as any animal is found to be tuberculous, it should be removed from the remainder of the herd, so as to prevent further spread of the disease. The subsequent disposal will depend upon varying conditions. Tuberculous animals cannot be disposed of by law, except under conditions that are provided for by the state.

The owner has three options as to the method of disposal. 1st. The cattle, if in good physical condition, may be shipped under the auspices of the State Live Stock Sanitary Board to some packing center, where they can be examined by federal inspectors. The owner receives the full net value of the cattle. This amount will depend upon whether the meat is condemned or not on account of the extent of the disease. When the disease is in the early stages in the glands, it is entirely safe for food.

2nd. The cattle may be appraised by three appraisers. The owner receives two-thirds of the appraised valuation, the maximum appraisal value being fifty dollars. The cattle are then slaughtered on the place by the state authorities, or are shipped by them to be slaughtered under federal inspection. The returns from their sale go to the state.

3d. If the affected cattle are valuable, pure-bred animals, the owner may hold them in quarantine under the rules of the State Live Stock Sanitary Board. Which of these options ought to be adopted by the owner will depend upon the circumstances of each individual case, and the Department of Bacteriology holds itself ready to take up a consideration of these cases individually.

DISINFECTION OF THE STABLE.*

It is exceedingly important after the disposal of the affected animals that the stable should be disinfected. All dust, dirt, and manure should be removed from the ceilings, walls and floors. Loose and broken feed boxes and mangers should be removed before applying disinfectant.

A thin whitewash prepared from *fresh unslaked* lime is to be applied by means of a spray pump, if possible, to the walls, ceilings and floors. The whitewash should be thin, if a pump is used, and if applied hot will be more effective. It is well

to add one pound of chloride of lime (bleaching powder) to each three gallons of whitewash. Do not use air-slaked lime as this has no disinfecting value. The mangers and feed boxes can be scrubbed with a hot saturated solution of sulphate of iron (copperas). The stables should be whitewashed two to three times yearly.

GRATUITOUS DISTRIBUTION OF TUBERCULIN.

The United States Department of Agriculture, recognizing the fact that the eradication of this cattle scourge is largely dependent upon the wholesale use of the tuberculin test, makes tuberculin which is distributed under certain conditions. Any farmer who will agree to use it in strict accordance with the rules laid down by this Station, this tuberculin will be furnished free of charge which is diluted ready for use. Application for same can be made on following blank. Read carefully conditions presented.

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*A bulletin of the State Live Stock Sanitary Board on the matter of barn disinfection will be sent to any applicant. Address either the Experiment Station, or State Live Stock Sanitary Board, Madison, Wis.

Return when filled out to H. L. Russell, Experiment Station, Madison, Wisconsin.

Tuberculin Record Blank Furnished by Wisconsin Agricultural Experiment Station.

NAME OF OWNER.	P. O. ADDRESS.	COUNTY.	NAME OF TESTER	P. O. ADDRESS.	Has this Herd been Tested before. When and by Whom?

First Day. Second Day.
Time ..... A. M. .....A. M.
watered ... P. M. .....P. M.

Date of Test .....
Insert hours at which temperatures were taken

Hour of Injection .....P. M.

Give date on Bottle of Tuberculin used .....

Test No. of Animal.	Breed.	Age.	Est. Weight.	TEMPERATURES BEFORE INJECTING.				TEMPERATURES AFTER INJECTING.							Amount Injected (Cubic Cent.)	Diagnosis. (Leave Blank.)	
				M.	M.	M.	M.	M.	M.	M.	M.	M.	M.	M.			
1																	
2																	
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NOTE.—Register all fractions of a degree in decimal tenths, as for example, 101.5, and fill out all blank spaces of this report correctly.

DATA ON TEST SHEETS.

(To be filled by tester and sent to H. L. Russell, Madison, Wis.)

Name of owner .....
P. O. Address ..... County.....
Name of tester .....Address.....
No. of animals tested..... No. of animals reacting..... No. of animals suspicious .....

DIRECTIONS FOR MAKING TEST.

During the test animals must be kept in as nearly a normal condition as possible. Before injection take four temperatures about two hours apart. Inject in the evening about nine o'clock; eight to ten hours after injection begin taking temperatures and continue until at least five temperatures, two hours apart, have been taken. In case any animal shows an abnormally high temperature at the end of this period, continue taking temperatures until a decided drop toward the normal is noted.

WATERING.

Water before beginning temperature readings the first day of test; on second day give small quantity (a pailful or so in barn) if necessary, and turn out stock in afternoon for further watering. Large quantities of cold water reduce temperature and if animals are watered at usual time in morning, on day following injection, marked errors may be caused in the test.

State if any animals are near calving or in heat.

Should you have any unopened bottles of tuberculin on hand kindly return same to us.

THE TESTER WILL PLEASE SEE THAT THE FOLLOWING DATA ARE RECORDED.

How many of this herd were bought? .....
Do any of the animals of this herd show persistent coughing? .....
Are any emaciated? .....
If so, give test number of each such animal .....
Answer following questions for each animal that has a temperature of 104 degress F. or above.

Test No. of animal .....
Bought or raised .....
When purchased .....
Of whom .....
Address .....

THE WISCONSIN CORN CROP.

Breeding, Growing and Dissemination.

R. A. MOORE.

For many years Wisconsin has been handicapped in corn growing. Our southern neighbors have told us that we were out of the "Corn Belt", and unless we could come over into the corn belt, there was little use of growing anything except flint corn in Wisconsin.

A careful survey of the climate and other conditions seemed to show that Wisconsin is not out of the corn belt, but is very much inside and underneath the belt proper. All that seems necessary is to stop purchasing seed corn in accordance with the scoop-shovel method and stop trying to adapt southern grown corn for our conditions. The corn needed is Wisconsin corn belt corn, bred and acclimated especially for different localities of the state. The Wisconsin Experiment Station undertook the task of developing the varieties of corn and with the aid of the Experiment Association within five years have established Wisconsin corn, "true Badger corn" in every county of the state.

Five yeais ago Wisconsin produced 28.2 bushels of shelled corn per acre. Secretary Wilson sends forth in the U. S. Crop Reporter the remarkable yield for Wisconsin of 41.2 bu. per acre for the year of 1906. Wisconsin's yield per acre is only surpassed by the state of Ohio, which has a yield of 42.6 bushels per acre.

Parties who have not understood what has been going on in the state of Wisconsin in regard to corn breeding, can hardly realize what is meant by the figures I have given you. What that means is this, that Wisconsin this year has grown twenty million bushels more corn on approximately the same acreage than she did in 1902.

The breeding, acclimating and dissemination of corn for various sections of the state has been an important factor in bringing about this increased yield. The Wisconsin Experiment Association has come to the rescue for better corn pro-

duction. By the establishment of several thousand corn centers, the improved varieties have been grown and acclimated in all sections of the state and farmers now have within easy reach good seed corn, which they can purchase fire dried in the ear that has been grown under their own local conditions.

It is surprising what an association of 1,200 young farmers can accomplish when all proceed in a systematic way along one line of effort.

During the five years' work with corn at the Experiment Station a few things have been learned that are of vital interest to the Wisconsin corn breeder and will be herewith given with the hope that some farmer will be benefited thereby.

For improvement of yield we should observe careful selection of seed ears when stalk study is permissible. The ears should not be taken from the stalks till well matured. Seed corn should not be dumped on a floor, but hung in a well ventilated room or top of corn crib to dry. A well ventilated furnace room is an admirable place to cure corn. Small outside buildings, well ventilated, with corn racks arranged and shielded stove in center of room is preferable for drying large amounts of seed corn. After seed corn is well dried, it will stand moderate weather without serious results.

The ear we desire should be cylindrical and true to type, tapering ears are objectionable as they do not carry uniform kernels. Kernels should be of medium depth and of practically the same width from butt to tip with edges fitting closely from crown to cob. Ears having sixteen to twenty rows are preferable for our latitude, as by carrying that number of rows, they dry out more readily than if carrying more. A slightly roughened seed coat is desirable and the corn should come well down around the shank, which should be of medium size. The tips of the ears should be fairly well filled, but do not discard the ear if a few tip kernels are missing when other good characteristics are present.

Ears should be of uniform size, 8 to 10 inches in length, and 6 to 7 inches in circumference. Uniformity in size of ear usually carries with it uniformity in size of kernels.

The secret of good crops is largely in the seed. Only the best should be planted. No uniformity of stand can be secured unless seed has good germinating power. All corn of doubtful character should be tested General test should first be made by taking at least two kernels from each of fifty ears and making test in simple plate tester. If test is from 98 to 100%

strong and vigorous, and corn was cured under similar conditions, the farmer can be reasonably certain the corn is all right. Resort to the ear test, if general test is low, or if any doubt exists, as it will amply repay for time and trouble.

Before testing make general selection of ears that have kernels of about the same size. Use planter plate that will plant by check row system three or four kernels to a hill. Stay by planter until it will drop four kernels eighty out of a possible one hundred times.

Shelled corn should not be purchased for seed. Every corn grower should insist on having seed corn shipped in the ear so that he can test the same before planting and discard it if of no value. There is no good reason why any honest seed corn dealer should refuse to sell corn in the ear.

Bear in mind that in order to lock the vitality of seed corn in the kernel until time of planting, the corn should be fire dried and then stored in a safe place.

As an aid to members of the Experiment Association, who will not have an opportunity to take up the systematic judging of corn, I will herewith give the score card used by the students in the college together with explanations and suggestions to emphasize corn improvement in Wisconsin.

WISCONSIN OFFICIAL CORN SCORE CARD.

		1	2	3	4	5
1 Trueness to Type or Breed characteristics	10					
2 Shape of ear	10					
3 Color: a. Grain	5					
b. Cob	5					
4 Market condition	10					
5 Tips	5					
6 Butts	5					
7 Kernels: a. Uniformity of	10					
b. Shape of	5					
8 Length of ear	10					
9 Circumference of ear	5					
10 Space: a. Furrow between rows	5					
b. Space between kernels at cob	5					
11 Percentage of Corn	10					
Total	100					

EXPLANATION OF POINTS IN CORN JUDGING.

1. *Trueness to Type or Breed Characteristics:* Theten ears of the sample should possess similar or like characteristics and should be true to the variety which they represent.
2. *Shape of ear*: The shape of the ear should conform to variety type, tapering slightly from butt to tip, but approaching the cylindrical.
3. *Color a. Grain; b Cob.* Color of grain should be true to variety and free from mixture. White corn should have white cobs, yellow corn, red cobs.
4. *Market Conditions*: The ears should be sound, firm, well matured and free from mould, rot or injuries.
5. *Tips*: The tips of the ears should not be too tapering and should be well filled with regular uniform kernels.
6. *Butts*: The rows of kernels should extend in regular order over the butt, leaving a deep impression when the shank is removed. Opened and swelled butts are objectionable.
7. *Kernels*: *a. Uniformity of*; *b. Shape of.* The kernels should be uniform in shape, size and color, and true to the variety type. The kernels should be so shaped that their edges touch from tip to crown. The tip portion of the kernel is the richest in protein and oil, and hence of the highest feeding value. For this reason the tip portion should be full and plump.
8. *Length of ears.* Northern section 8 to 9 inches, central section 8¼ to 9¼ inches, southern section, 8½ to 9½ inches. Long ears are objectional because they usually have poor butts and tips, broad, shallow kernels, and hence a low percentage of corn.
9. *Circumference of ear:* Northern section 6 to 6½ inches, central section 6¼ to 6¾ inches, southern section 6½ to 7 inches.
10. *a. Furrow between rows; b. Space between furrows at cob.* The furrow between the rows of kernels should be small. Space between kernels near the cob is objectionable.
11. *Percentage of corn:* The percentage of corn is determined by weight; depth of kernels, size of cob and maturity all affect the percentage.

RULES TO BE USED IN JUDGING.

1. *Length of Ear*—The deficiency and excess in length of all ears not conforming to the standard should be added together, and for every inch thus obtained a cut of one point be made.
2. *Circumference of Ear*—The deficiency and excess in circumference of all ears not conforming to the standard should be added, and for every inch thus obtained a cut of one-half point should be made. Measure the circumference at one-third the distance from the butt to the tip of the ear.
3. *Percentage of Corn.*—Per cent of corn should be from 85 to 87. In determining the percentage of corn, weigh and shell every alternate ear in the sample. Weigh the cobs and substract from weight of ears, giving weight of corn. Divide the weight of corn by total weight of ears, which will give the per cent of corn. For each per cent short of standard, a one-point cut should be made.
4. *Color of Corn and Cob.*—A red cob in white corn, or a white cob in yellow corn, should be cut five points. For each mixed kernel a cut of one-tenth point should be made. Kernels missing from the ear shall be counted as mixed. Difference in shade or color, as light or dark red, white or cream color, must be scored according to variety characteristics.
5. *Scoring Tips*—Where one inch of the cob is exposed, a cut of one-half point should be made, and a proportionate cut as the cob is less exposed. Regularity of the rows near the tip and the shape and size of the kernels must also be considered in scoring tips.
6. *Scoring Butts*—If the kernels are uniform in size and extend over the butt in regular order, give full marking. Small and compressed or enlarged or open butts are objectionable, as are also those with flat, smooth, short kernels, and must be cut according to the judgment of the scorer.
7. Ten ears of corn constitute a sample for scoring.

EXPLANATION OF POINTS AND RULES FOR JUDGING DENT CORN.

Points.	Perfect score.	Things to consider.	Rule for cuts.
1 Trueness to type or breed characteristics.	10	Approximate approach to type in form of kernel, indentation, shape of ear and color of grain.	Cut ½ point for each ear badly off type and less as judgment of scorer dictates
2 Shape of ear.	10	Ear shape should conform to standard for variety. Should not be crooked, too pointed, etc.	Cut 1 point for each poorly shaped ear.
3 Color. (a) Grain.	5	Should be free from mixed or missing kernels and true to color for the variety.	Cut 1-10 point for each mixed or missing kernel. Variations in color of grain to be cut according to judgment of scorer.
(b) Cob.	5	Cobs should be a dark, cherry red for yellow corn and a glistening white for white corn.	Cut 5 points for every white cob in yellow corn or red cob in white corn.
4 Market condition.	10	Corn should be ripe, sound and free from injuries or disease. Should be bright in color.	Cut 1 point for every diseased, chaffy, injured or immature ear.
5 Tips.	5	Kernels should extend over the tip in regular rows Should cover the tip and be uniform in size and shape	Cut ¼ point for every badly covered tip. Cut 1 point for every inch of exposed tip
6 Butts.	5	Kernels should extend over butts in regular rows and should be well developed, not flat Butt should be well covered.	Cut 3 10 point for every butt, well covered butt with flat kernels. Cut ½ point for every uncovered butt.
7 Kernels. (a) Uniformity.	10	Should be alike in shape and size.	Cut 1 point for each set of kernels lacking in uniformity
(b) Shape.	5	Kernels should be perfect wedge shape, narrower or wider according to variety.	Cut ½ point for each poorly shaped set of kernels.
8 Length of ear.	10	Should have standard length for the section where corn is grown	Cut 1 point for every inch of excess and deficiency in length.
9 Circumference of ear.	5	Should have standard circumference for section.	Cut ½ point for every inch of excess and deficiency in circumference.
10 Space. (a) Furrows between rows.	5	Space between kernels at crowns. Furrows should be straignt.	Cut ¼ point for 1-32–1-16 inch in width. Cut ½ point for 1-16 inch and above.
(b) Between kernels at cob.	5	Space between the tips of kernels at point of attachment to cob.	Cut ½ point for each ear showing space between kernels at the cob.
11 Proportion of grain to ear.	10	Should conform to standard for the variety.	Cut 1 point for each per cent. short of standard weight for the variety.

CORN JUDGING. LESSON I.

Trueness to Type or Breed Characteristics.

The study of corn like the study of stock is now taken up from a practical and scientific standpoint, and we trust will be carried forward to a successful issue. Score cards have been adopted by colleges in different states where the subject of corn judging is taught, with slight variations. By following the suggestions accompanying the score card and the general discussions given therein on the different divisions under which corn is judged one may become quite familiar and proficient in judging corn under the score card system.

Fairs and other associations where prizes are given for best display should provide that ten ears should be considered as a sample, as that number is now used at exhibitions in other states and should become uniform throughout Wisconson. This number is taken as it furnishes an easy basis for calculation. The samples of corn should be arranged on tables so that the judge can have easy access to the same, pass judgment in a comfortable position and have abundant space for comparison.

The first subject to be considered in judging a sample is trueness of type or breed characteristics for which ten points are allowed if the sample is perfect. Corn like cattle belongs to a great family, this family being subdivided into species or types. We are interested in particular with the flint and dent species of corn which are grown generally. Other species we might mention are pop corn, pod corn, sweet corn and soft corn. Each of the above species are divided into numerous breeds or varieties, which is brought about by the ingenuity of man combined with variation in climate, soil, cultivation, etc. The Dent corn is the great commercial corn of the United States, and that with which so much progress has been made by breeding during the past five or six years, consequently we will consider this corn specifically and the other groups generally.

The score card is arranged for Dent corn and the rules and suggestions given in connection with the score card refer to the Dent in general.

Different breeds of corn, like different breeds of cattle, have distinctive characteristics by which they are recognized. Those breeds having a particular color are easy to distinguish between as Boone County White from Reid's Yellow Dent or either of

these races from the Calico or Strawberry Dent. When one wishes to distingush between breeds of the same color it is more difficult, and it is only by actual experience in handling and studying the markings that one can become proficient. The markings of pure breeds are quite distinct as the breeder working for improvement has been trying to make prominent one or more desirable characteristics. This is plainly noticeable in the Reid's Yellow Dent and the Leaming, two of the pure yellow breeds of Illinois. These varieties differ in shade of color, the Reid's being a pale yellow while the Leaming is more highly colored, approaching an orange color. In other characteristics the Reid's Yellow Dent has a cylinderical ear and furrows running from butt to tip, while the Leaming has more of a tapering ear and occasionally drops one or more furrows at the middle of the ear. Different seed coats are allowable in the Ried's Yellow Dent, which may be either rough or smooth with a variation in the indentation from a round dimple dent to a wide narrow dent. The Leaming has a roughened seed coat which is characterisic of the breed. The breeds of the white corn like the yellow have certain characteristics peculiar to each, and are readily distinguished after an acquaintance is formed.

The corn breeders of Wisconsin by becoming acquainted with the desired characteristics of seed corn will work with a common interest of producing and improving these desired qualities in the different breeds of corn that are to become standard varieties in various portions of the state. By several hundred working with the same purpose in view a breed of corn will be bred having the characteristcs which will be known on account of those similiar traits and the more nearly the corn conforms to this type the higher the marking can be given to it in uniformity and breed characteristics.

CORN JUDGING. LESSON II.

Shape of Ear, Cob and Kernels.

In judging the sample of ten ears of corn after considering trueness to type and breed characteristics we next examine closely the shape of the ear. Ten points are allowed if the ears are perfect in shape but it is as difficult to find an ear of corn perfect in shape as it is to find cows, horses, and sheep perfect in shape.

The shape of ears of the different varieties of corn differ as widely as the shape and form of the different pure-bred breeds of cattle. Each race and variety has a characteristic shape peculiar to the variety to which it belongs. For example, the Boone County White Corn has a long cylindrical ear, large in circumference, while the Leaming has an ear considerably shorter, finer in cob and a general taper to cob and ear.

If the characteristic shape desired in the Leaming corn were found in Boone County White, or Reid's Yellow Dent, it would be scored severely as it would not be characteristic of those breeds.

The shape most desirable to be found in corn is a cylindrical ear from butt to tip, and corn breeders are trying to secure this shape in all varieties, consequently we may expect to find in the future more uniformity in shape in the different breeds of corn.

Where ears are inclined to taper it will be noticed that two or more rows, as a rule, are dropped near the middle of the ear. otherwise the kernels on the cob are irregular being deeper and larger at the butt than at the tip. This makes the kernels vary in size throughout the ear, and renders the corn almost totally unfit for seed. No planter can plant kernels of this type so as to give a uniform stand, one of the desired characteristics of a field corn.

In scoring corn on shape one must take in consideration the soil and climatic conditions, under which the corn is grown.

The shape of an ear desirable for central Illinois would differ in many respects from the shape most desirable for central Wisconsin. Our shorter season demands a shallower kernel which will carry with it a different characteristic shape than that grown further south.

The characteristic wedge shape of kernel is the most desirable and this should receive consideration in judging samples or in the selection of seed for the season's crop. The wedge

shape kernel carries with it a greater depth, more rows to the ear, and a greater proportion of corn to cob.

Prof. A. D. Shamel, former instructor in corn judging at the University of Illinois says: "It has been found that there is a correlation between the shape of the kernel and the composition. For instance, a kernel having a thin tip is low in per cent of oil and protein and high in per cent of starch. It is usually true that such pointed kernels are low in vitality or lack constitution. The most desirable shape is plump tips, having about the same thickness as the upper portion of the kernel.

No set rule can be given as to the exact number of points to be taken from the full score on account of any particular weakness in regard to shape. The scorer after carefully noting the deficiency in shape will rely on his individual judgment in marking the score and not be dependent on any set rule.

CORN JUDGING. LESSON III.

Color of Grain and Cob.

Having already considered breed characteristics and shape of ear, the next essential to examine is color which we consider under two heads, viz., color of grain and color of cob. Five points are allowed on color of grain and five on color of cob where each is perfect.

Yellow corn should have a red cob and white corn a white cob in pure-bred varieties. Anything to the contrary would show defectiveness in purity of breeding and should be cut severely by the corn judge and rejected as seed by the corn breeder.

The color of the corn varies with the breed, the Reid's Yellow Dent has a pale yellow color, while the Leaming has a brighter shade of yellow and these shades predominate and are characteristic of the breed. Other yellow breeds vary slightly in color from a pale yellow to a deep orange, and are only known by a thorough acquaintance with the variety of corn under consideration and are then cut accordingly.

The cob in yellow corn should be a bright cherry red and as the color of cobs vary from this standard, a cut should be made by the scorer. A bright cherry red cob denotes health and vigor

in corn and a pale or dark red cob denotes lack of constitution or vitality. The white cobs should be a glistening white and not a dead pale color. The above points should be considered when scoring corn at fairs or when the corn breeder is carefully selecting seed for the season's crop.

General questions, however, are often asked as to whether it is preferable to grow white or yellow corn, and which is the richest in the food elements, and which will produce the most grain and forage per acre, etc.

From tests made by careful breeders of corn, and by experiment stations, it has been found that in general, color makes no difference as far as quality is concerned, and it is merely a matter of taste to the grower as to the color of corn he desires.

White or yellow corn through careful breeding of one variety and neglect of the other would soon show a marked difference in regard to yield and quality in favor of the variety to which attention had been given, regardless of color.

Like the breeder of live stock, the corn grower had better select that breed of corn that suits his ideal taste best, keeping in mind that the quantity and quality of marketable corn per acre are the essential characteristics sought for.

CORN JUDGING. LESSON IV.

Market Condition.

Ten points are allowed on the score card where market condition is perfect. By market condition we mean general excellence and that degree of ripeness or maturity that is taken note of from the grower's or feeder's standpoint. Corn that shows immaturity and a tendency to be loose on the cob with wide space between the kernels should be cut severely on the score card under market condition. Where market condition is perfect or nearly so the kernels are firm on the cob and the ear gives a rasping sound when twisted. The kernels fit closely together lengthwise upon the cob between the rows and crosswise between the kernels of each row. Corn when scored from the feeder's standpoint is not cut so severely as from the grower's or seedsman's standpoint. When we consider that a bushel

of corn plants approximately seven acres and the importance to be attached to uniformity of stand we will fully appreciate the value of considering the market condition from the grower's standpoint in a critical way.

No one head under which corn is judged is so important to Wisconsin farmers as market condition, and all farmers of the state should not only be able to judge corn from that standpoint but should understand how to work for the perfection of that characteristic.

Several standard varieties of corn will have to be established in various portions of the state that will ripen properly under the conditions peculiar to that section. This can only be done by securing seed corn having those desirable traits that would naturally adapt it to a certain section of the state, and put it through a test. If farmers were to try this plan individually it would be many years before known varieties would be established, but Wisconsin is fortunate in the fact that it has an association of ten hundred young men who are working on the corn problem at the present time, and definite results may be looked for in a reasonable period.

The utmost importance is attached to market condition in carrying on trial tests as a variety of corn would be of little value to a community or division of the state, if it would not properly mature. Much can be done in the way of planting and cultivating the crop to hasten maturity, and this should be resorted to.

The check-row system of planting admits more sunlight and a freer circulation of air through the corn than the drill system.

The cultivator can be worked more effectually to retain moisture, and keep down the weeds which enables the corn to gain several days in the race for maturity over corn of the same variety that has been planted in drills. Corn will gradually become accustomed to its environment and will adjust itself to varying conditions. By selecting those ears for seed that show good market condition, even if there be but few in the entire field, the earliness of the corn can be improved upon materially.

It is possible to mature the Illinois dent corns in certain portions of Wisconsin by giving them special conditions, such as location, and planting merely one kernel in a hill the ordinary width of the planter. Much good, through careful work may yet be derived from the seven standard varieties of corn that have recently been established for Illinois. It seems that Wisconsin with her 1½ million acres of land annually devoted to

corn should propagate in the shortest possible time, varieties best adapted for various localities, and then to hold to those established strains that annually show good market condition.

CORN JUDGING. LESSON V.

Butts and Tips.

In scoring butts and tips we allow five points for each if perfect, but cut down in accordance with imperfections. A well filled butt that is symmetrical and not bulging is desirable. The corn should come well over toward the shank so when snapped a rounded hollow space would be plainly noticeable. The corn breeder desiring to get a large proportion of corn to cob often goes too far in breeding for a small shank and nearly a full covered butt. Where the shank is too small the ears drop off during the ripening period or readily tear off while harvesting. Where this weakness is noticeable the butt should be cut accordingly on the score card. Poorly filled butts are caused by the first silks developing too far in advance of the pollen and drying to such an extent that they do not become fertilized when the pollen ripens. All ears, where the butts are partially filled, should be rejected or this characteristic may become permanent or partially so. If an earlier variety of corn or corn more advanced should be in an adjoining field the butt kernels are liable to be mixed by being fertilized with this foreign pollen instead of the pollen from their own variety. It is largely on account of chance crossing that occurs to the butt and tip kernels that those kernels are rejected when planting. Their peculiar formation makes them non-uniform which interferes in planting evenly and they also seem weaker in germination and more tardy in growth than kernels from the middle or intermediate parts of the ear. The tip kernels are apt to be flinty and pop corn shape which is undesirable in dent corn.

A perfect tip which has a center kernel termed a cap is hard to find but occasionally a few are found where large quantities of corn are handled. In a perfect tip the rows of corn should come over the tip in regular order and meet near the apex. The kernels should be uniform in size and shape and should not be mixed or shallow. Where bare tips are noticeable to

quite an extent throughout the field, we allude the same to the fact that the silks formed last, which represent the tips, were too late for the pollen, and as a result were not fertilized.

By planting ears having defective tips that undesirable characterstic would soon become permanent or nearly so. Open tips have a tendency to increase the shallowness of kernels on the tip half of the ear which makes the corn on that portion of the ear undesirable for planting on account of the lack of uniformity compared with the kernels on the butt portion of the ear.

From the standpoint of the corn judge, butts and tips that do not meet the standard should be scored quite severely, and should carefully be rejected by the corn grower where the defect is too prominent.

CORN JUDGING. LESSON VI.

Kernel Study.

The seventh division under which ear corn is judged is kernel study for which 15 points out of 100 are allowed; 10 for uniformity and 5 for shape.

The kernels should be uniform in shape, size, and color and true to the variety type. The shape should be such that the edges of the kernels touch from tip to crown. The tip portion of the kernel, that part attached to the cob and which contains the germ, is rich in protein and oil and hence of the highest feeding value. For this reason the tip should be full and plump. A plump tip also denotes vitality and constitution. Corn growers should regard with suspicion corn that has weak and shriveled tips no matter how well the outside of the ear may look. At least 85 per cent of all the oil in the kernel is in the germ which extends from within the tip upward, hence corn of high oil content is preferable for factories where the manufacture of corn oil is emphasized. The time is approaching when corn may be purchased on a basis represented by its chemical constituents instead of by the pound or bushel. Milk and cream are now purchased almost universally by their butter fat content and grains will be the next in order. Tests by the Illinois Experiment Station show that the oil content in corn may vary

from 2½ to 7½ and protein from 6½ to 16 per cent. Protein is valued at 5 cents per pound while starch is less than 1 cent. It does not seem fair for a farmer who has used care in selecting high protein seed corn to be obliged to take the same price per bushel for his crop as one who is raising only ordinary corn. When Wisconsin farmers market more corn we feel confident that the matter of selling by the test will be carefully investigated. At the present time nearly all the Wisconsin corn is marketed through farm animals which undoubtedly is the best possible way of marketing farm crops. By so doing we put our animals in proper condition for the market and save middle men's profits on our crops as well as retaining the fertilizing elements contained therein to keep up the fertility of the farm.

If seed corn high in protien and oil content is planted the progeny will be high in those desirable characteristics. One bushel of seed corn will plant about seven acres. Will it not then pay Wisconsin farmers to carefully select seed corn that is high in oil and protein?

CORN JUDGING. LESSON VII.

Selecting Corn of High Oil and Protein Content.

From careful experiments carried out by the Illinois College of Agriculture extending through a series of years it has been determined definitely that the composition of the corn kernel can be materially changed. From many thousand tests at the Chicago Glucose factories it has been found that the composition of whole corn is approximately as follows:

Starch	70.0%
Water	11.4%
Protein	10.5%
Oil	4.5%
Fiber	2.2%
Ash	1.4%

It will be noted that the starch content is extremely high compared with the other elements, hence the claim that corn is a one sided ration for farm animals.

The farmer is particularly interested in the oil and protein content of the corn, consequently the richer the corn is in these elements the more money value per bushel the corn is worth for feeding purposes. Plants, like animals, do not improve if left merely to nature's laws but strive to maintain a certain standard. It has remained for man to step in and by changing environment and following certain definite principles accomplish beneficial results.

In the improvement of corn the farmer can by the proper selection of seed materially change the constitutents, most desired, from a lower to a higher degree thus growing a corn of higher value for feeding farm animals. The composition of different kernels of corn taken from the same ear are approximately the same, hence a single kernel from an ear is a fair index of the composition of all the remaining kernels of that particular ear. By planting corn that is high in oil and protein the crop grown from that select seed is also high in those desirable elements.

By a physical examination of one kernel from each ear the relative composition as to oil and protein can be fairly accurately determined. No difficulty will be experienced in distinguishing between ears that are high and low, in protein and oil after a few comparisons are made.

To make these determinations all the apparatus necessary is a pocket knife. Remove at least two kernels of corn from the ear and examine closly, if that portion of the kernel next to the cob known as the tip is pointed, shriveled and has a small face mark covering the germ, discard the ear at once, as it will be found not only low in oil but low in vitality as well. The face mark under which the germ is found should be broad and extend from the tip well up toward the top or crown of the kernel. This indicates a large germ beneath. Practically 85% of all the oil in the kernel is found in the germ which is also rich in protein, hence the desirability of a large and well developed germ. The kernel has to be cut in order to determine the protein content as that is noticeable within. The kernel should be cut from tip to crown through the narrow and broad dimensions, this will bring plainly to view the germ which is of a dark gray color; the starch is white, and a flinty composition which is of a grayish white in white corn, and a dull yellow in yellow corn. The large portion of the protein contained in the kernel is found in this flinty matter. If the flinty portion of the kernel fits closely to the germ and crowds the white starchy mat-

ter into comparatively small space, the corn upon the ear from which the kernel was selected is high in protein. After the examination of a few kernels one will make note of the relative size of the parts at a glance.

It seems that it will amply repay any farmer to select a few bushels of seed corn in this way from year to year until a high standard of corn is obtained.

WISCONSIN COLLEGE OF AGRICULTURE

MADISON

DEPARTMENT OF AGRONOMY.

OFFICIAL WHEAT SCORE CARD.

NAME OR NUMBER OF SCORER..... DATE.....

SAMPLE NO... ..... TABLE ... .

		1	2	3	4	5
1. Trueness to type or breed characteristics	10					
2. Uniformity in size and shape of kernel	10					
3. Color of grain	10					
4. Freedom from mixture with other grains	15					
5. Size of kernel	10					
6. Per cent and nature of weed seed, dirt and other foreign material	15					
7. Per cent of damaged, smutty or musty kernels	5					
8. Weight of grain	10					
9. Viability	15					
Total.....	100					

Reasons for student's score on test sample.

Numbers below refer to the various heads under which the sample of grain has been judged.

1 .....

2 .....

3 .....

4 .....

5 .....

6 .....

7 .....

8 .....

.....

WISCONSIN COLLEGE OF AGRICULTURE.

MADISON.

DEPARTMENT OF AGRONOMY.

OFFICIAL OAT SCORE CARD.

NAME OR NUMBER OF SCORER..... .... DATE..... . ....
SAMPLE NO ..... TABLE .....

		1		2		3		4		5	
1. Trueness to type or breed characteristics	10										
2. Uniformity in size and shape of kernels	15										
3. Color of grain	5										
4. Freedom from mixture with other grains	5										
5. Size of kernel	10										
6. Per cent and nature of weed seed, dirt and other foreign material	15										
7. Odor—musty, smutty, sulphur	10										
8. Weight per bushel	10										
9. Percentage of meat to hull	5										
10. Viability	15										
Total	100										

Reasons for student's score on test sample.
Numbers below refer to the various heads under which the sample of grain has been judged.

1..... .....
2.....
3.....
4..... ....
5.....
6.....
7..... ....
8..... .....
9..... .. ..
10..... .. ..

WISCONSIN COLLEGE OF AGRICULTURE.

MADISON.

DEPARTMENT OF AGRONOMY.

OFFICIAL BARLEY SCORE CARD.

NAME OR NUMBER OF SCORER ..... DATE.....

SAMPLE NO ..... TABLE.....

		1	2	3	4	5
1. Trueness to type or breed characteristics	10					
2. Uniformity in size and shape of kernel	15					
3. Color of grain	15					
4. Freedom from mixture with other grains	15					
5. Size of kernel	5					
6. Per cent and nature of weed seed, dirt and other foreign material	10					
7. Per cent of damaged or smutty kernels	5					
8. Weight of grain	10					
9. Viability	15					
Total	100					

Reasons for student's score on test sample.
Numbers below refer to the various heads under which the sample of grain has been judged.

1.....
2.....
3.....
4.....
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7.....
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9.....

WISCONSIN SEED GRAIN GROWERS.

Members of the Experiment Association are rapidly becoming the seed growers of the state, and by systematic selection of seed and care in culture and curing of the crop, produce a fine grade of pure-bred seed grains. These seed grains are sold by the producers either in small or large quantities, at reasonable rates.

Swedish Select oats (Wisconsin No. 4).

Name of grower.	Address.	County.
Tomkins, O. Scott.....	Ashland, Box 304.....	Ashland.
Heldstab, C. O.....	Rice Lake.....	Barron.
Roeckel, Jos. P.....	Lark	Brown.
Bilderbach, W. T.....	Mondovi	Buffalo.
Cooke, Carl.....	Mondovi	Buffalo.
Gueldner, Willie.....	Mondovi	Buffalo.
Hustad, Martin C. T...	Modina	Buffalo.
Jahn, Chas.....	Cream	Buffalo.
Joos, Frank B.....	Fountain City.....	Buffalo.
Muehleisen, Gottlieb...	Tell	Buffalo.
Suhr, Otto A.....	Cochrane	Buffalo.
Peterson, Henry N.....	New Holstein.....	Calumet.
Kramer, Henry F.....	Bloomer	Chippewa.
Lebeis, Frank J.....	Bloomer	Chippewa.
Lee, E. W.....	Granton	Clark.
Thompson, Theo.....	Curtiss	Clark.
Zerbel, H.....	Humbird	Clark.
Capener, Howard H....	Portage	Columbia.
Chrisler, Harley E....	Lodi	Columbia.
Chipman, W. R.....	Morrisonville	Columbia.
Ellickson, A. C.....	Arlington	Columbia.
Foster, Carl C.....	Fall River.....	Columbia.
Hanson, E. A.....	Pardeeville	Columbia.
Jung, A. E.....	Randolph	Columbia.
Lloyd, Evan B.....	Cambria	Columbia.
Belda, William F.....	DeForest.....	Dane.
Benson, Ed. E.....	Mt. Horeb, R. 5.....	Dane.

Swedish Select oats (Wisconsin No. 4).

Name of grower.	Address.	County.
Chatterton, R. W.	Basco	Dane.
Dreger, E. L.	Madison, R. 7	Dane.
Ford, J. F.	Mazomanie, R. F. D.	Dane.
Gillette, R. A.	Verona	Dane.
Hillier, H. B.	Waunakee	Dane.
Holscher, A. C.	Cottage Grove	Dane.
Hopkins, S. Y.	Basco	Dane.
Jordalen, Clarence	Stoughton	Dane.
Kaltenberg, Anthony	Waunakee	Dane.
Maeder, J. W.	Oregon, R. 3	Dane.
Mitchell, J. T.	Cottage Grove	Dane.
Renk, H. J.	Sun Prairie	Dane.
Semb, T. A.	Madison, R. 6	Dane.
Thorstad, N. H.	Deerfield	Dane.
Wernick, William H.	DeForest	Dane.
Ehrhardt, Daniel	Knowles	Dodge.
Goetsch, Albert A.	Juneau	Dodge.
Grebe, Fred P.	Fox Lake	Dodge.
Howitt, Chas. H.	Randolph	Dodge.
Irving, J. W.	Randolph	Dodge.
Krueger, Henry E.	Beaver Dam, R. 1	Dodge.
Mahoney, David	Juneau	Dodge.
Schiller, Claude E.	Beaver Dam	Dodge.
Owens, H. C.	Fox Lake	Dodge.
Boucsein, Gust	Detroit Harber	Door.
Millar, Will	Menomonie	Dunn.
Donaldson, H. A.	Eau Claire, R. 3	Eau Claire.
Konz, John Sr.	Fairchild	Eau Claire.
Russell, A. C.	Augusta	Eau Claire.
Wright, Geo. T.	Eau Claire, Box 195	Eau Claire.
Wright, Wray C.	Eau Claire, Box 195	Eau Claire.
Bonzelet, J. P.	Eden	Fond du Lac.
Carpenter, L. A.	Fond du Lac, R. 7	Fond du Lac.
Hinz, A. F.	Ripon	Fond du Lac.
Kuehn, Chas. A.	Brandon	Fond du Lac.
Meekin, H. W.	Fond du Lac	Fond du Lac.
Miritz, O. F.	Fond du Lac	Fond du Lac.
Oleson, Janes	Ripon	Fond du Lac.
Stroup, Fred G.	Fond du Lac, R. 5	Fond du Lac.
Welles, M. L.	Rosendale	Fond du Lac.
Whittaker, Horace	Fond du Lac	Fond du Lac.
Fruit, Bert L.	Platteville	Grant.
Stivarius, Geo. A.	Fennimore, R. 4	Grant.
Vosberg, H. L.	Louisberg, R. 2	Grant.
Wiseman, Paul	Bridgeport	Grant.
Biglow, L. F.	Brooklyn	Green.
Marty, Matthias	Monticello, R. 1	Green.
Clark, Clarence	Markesan, R. 5	Green Lake.
Miller, Guy E. Jr.	Markesan	Green Lake.
Lloyd-Jones, Enos	Hillside	Iowa.
Osborne, Jno. F.	Linden	Iowa.
Osborne, W. F.	Linden	Iowa.
Ruggles, William Guy.	Ridgeway	Iowa.
Dettinger, Wm. F.	Hixton	Jackson.

Swedish Select oats (Wisconsin No. 4).

Name of grower.	Address.	County.
Dietrich, John J.	Black River Falls	Jackson.
Krueger, Alexander	Watertown, R. 2	Jefferson.
McIntyre, Ivan	Ft. Atkinson	Jefferson.
Ward, W. Rodell	Ft. Atkinson, R. 1	Jefferson.
McNown, J. H.	Mauston	Juneau.
Wagner, J. M.	Union Center, R. 1	Juneau.
Bradley, J. Frank	Somers	Kenosha.
Brook, James W.	Salem, R. 1	Kenosha.
Holloway, John W.	Union Grove	Kenosha.
Myrick, M. O.	Bristol	Kenosha.
Katel, W. C.	Kewaunee	Kewaunee.
Smithwick, Jas.	Kewaunee, R. 6	Kewaunee.
Griswold, H. W.	West Salem	LaCrosse.
Moe, R. J.	Holmen	LaCrosse.
Winger, George	Argyle	LaFayette.
Leverenz, Roy B.	Tomahawk	Lincoln.
Heidemann, Otto C.	Kiel, R. 2	Manitowoc.
Klann, Adolph	Hayton	Manitowoc.
Roethel, Herman	Kiel	Manitowoc.
Straka, Edward E.	Kellnersville, R. 2	Manitowoc.
Sullivan, Jas. A.	Grimms	Manitowoc.
Thieleke, Edwin A.	Cleveland	Manitowoc.
Wiegand, Otto R.	Cleveland, R. 2	Manitowoc.
Balarsh, Frank	Peshtigo	Marinette.
Olson, Otto W.	Walsh	Marinette.
Dennison, Nicholas	No. Milwaukee, R. 10	Milwaukee.
Neilson, William C.	No. Milwaukee, R. 10	Milwaukee.
Pierner, Fred	No. Milwaukee, R. 11	Milwaukee.
Fox, C. L.	Leon	Monroe.
Freeman, G. A.	Sparta, R. 1	Monroe.
Hanchett, W. H.	Sparta	Monroe.
Harris, R. E.	Warrens	Monroe.
Leverich, J. W.	Sparta	Monroe.
Robertson, R. B.	Tomah	Monroe.
Jamison, W. G.	Appleton	Outagamie.
Letts, Edward E.	Appleton	Outagamie.
Mueller, Edw. O.	Appleton, R. 1	Outagamie.
Ryan, Malachi	So. Kaukauna	Outagamie.
Kieffer, Mike	Fredonia	Ozaukee.
Pierner, J. W.	Thiensville	Ozaukee.
Gullickson, Chas. E.	Cushing	Polk.
Nelson, Peter C.	Milltown	Polk.
Tretsven, Oscar	Milltown	Polk.
Hanson, N. P.	Amherst Jct., R. 1	Portage.
Swenson, O. S.	Amherst Jct., R. 1	Portage.
Clark, W. E.	Stevens Point	Portage.
Klussendorf, Fred E.	Phillips, R. 1	Price.
Buehler, J. G.	Twin Bluffs	Richland.
Ghastin, Wm. J.	Twin Bluffs	Richland.
Monson, Chris.	Five Points	Richland.
Post, Harry L.	Sextonville	Richland.
Welsh, S. L.	Tavera	Richland.
Acker, James	Milton	Rock.

Swedish Select oats (Wisconsin No. 4).

Name of grower.	Address.	County.
Hoague, Charles C.....	Janesville, R. 7.....	Rock.
Lunde, K. I.....	Edgerton, R. 2.....	Rock.
Newhouse, K. K.....	Clinton	Rock.
Imholt, B. A.....	Houlton	St. Croix.
Paulson, P. A.....	Hudson	St. Croix.
Hackett, Chas.....	Baraboo	Sauk.
Hudson, Dwight.....	Reedsburg	Sauk.
Ochsner, Arthur C.....	Plain	Sauk.
Toole, W. A.....	Baraboo	Sauk.
Volz, Robert.....	Ableman	Sauk.
Hildemann, E. S.....	Belle Plaine.....	Shawano.
Becker, P. V.....	Plymouth	Sheboygan.
Fischer, Louis H.....	Haven, R. 6.....	Sheboygan.
Illian, William L.....	Adell, R. 19.....	Sheboygan.
Chrysler, Harvey.....	Galesville	Trempealeau.
Engleman, J. P.....	Ettrick	Trempealeau.
Hagestad, Andrew C...	Ettrick	Trempealeau.
Hegge, E. A.....	Pigeon Falls.....	Trempealeau.
Raichle, Will.....	Galesville	Trempealeau.
Mattison, Thomas.....	Blair	Trempealeau.
Warner, R. C.....	Whitehall	Trempealeau.
Olson, G. C.....	Westby	Vernon.
Parsch, Gustav A.....	Stoddard	Vernon.
Rundahl, J. K.....	Coon Valley.....	Vernon.
Wagner, J. M.....	Union Center.....	Vernon.
Dunbar, Harry D.....	Elkhorn	Walworth.
Meurer, Paul Jr.....	Genoa Junction.....	Walworth.
Schwartz, Walter W....	Troy Center.....	Walworth.
O'Connell, James.....	Hartford	Washington.
Pauls, John.....	Hartford, R. 4.....	Washington.
Blood, Ike.....	Mukwonago	Waukesha.
Haass, Otto.....	Merton	Waukesha.
Jones, Albert.....	Dousman	Waukesha.
Longley, H. N.....	Dousman	Waukesha.
Rosenow, Bros.....	Oconomowoc	Waukesha.
Spaulding, C. F.....	Oconomowoc	Waukesha.
Williams, A. R.....	Waukesha, R. 8.....	Waukesha.
Kneipp, William.....	Wevauwega	Waupaca.
Larson, LeRoy.....	Iola	Waupaca.
Carey, Henry.....	Pine River.....	Waushara.
Heuer, Edw. F.....	Wautoma	Waushara.
Blakely, Albert J....	Neenah	Winnebago.
Cross, A. J.....	Allenville	Winnebago.
Olson, Harry O.....	Larsen	Winnebago.
Bennett, H. J.....	Belvidere	Illinois.
Thompson, Thor Jr....	Wadena	Iowa.
Meyer, A. J.....	Howell, R. 7	Michigan.
Vandercock, R. I.....	Linden, R. 2	Michigan.

Oderbrucker Barley (Wisconsin No. 55).

Name of grower.	Address.	County.
Tomkins, O. Scott	Ashland, Box 304	Ashland.
Chrislaw, A. M.	Rice Lake, R. F. D. 3.	Barron.
Haus, Enoch	Rice Lake	Barron.
Heldstab, C. O.	Rice Lake	Barron.
Nies, Peter	Greenleaf	Brown.
Roeckel, Jos. P.	Lark	Brown.
Roffers, John A.	Green Bay, R. 7	Brown.
Bilderbach, W. T.	Mondovi	Buffalo.
Muehlensen, Gottlieb	Tell	Buffalo.
Nyre, Lawrence A.	Mondovi	Buffalo.
Peterson, C. T.	Grantsburg	Burnett.
Christoph, T. F.	Chilton	Calumet.
Peik, Edmund	Chilton, R. F. D. 4	Calumet.
Peterson, Henry N.	New Holstein	Calumet.
Bible, F. O.	Chippewa Falls	Chippewa.
Finstad, Jalmar B.	Bloomer	Chippewa.
Guptill, L. R.	New Auburn	Chippewa.
Johnson, Albert I.	Bloomer	Chippewa.
Kramer, Henry F.	Bloomer	Chippewa.
Lebeis, Frank J.	Bloomer	Chippewa.
Lund, Edwin	Bloomer	Chippewa.
Einfeldt, Albert	Greenwood	Clark.
Imig, Arthur H.	Neillsville	Clark.
Lee, E. W.	Granton	Clark.
Thompson, Theo.	Curtiss	Clark.
Zerbel, H.	Humbird	Clark.
Ellickson, A. C.	Arlington	Columbia.
Foster, Carl C.	Fall River	Columbia.
Jung, A. E.	Randolph	Columbia.
Sharpee, E. A.	Rio, R. F. D. 1	Columbia.
Sharpee, J. A.	Rio	Columbia.
Sharpee, P. A.	Rio	Columbia.
Ames, W. L.	Oregon	Dane.
Anthony, David C.	Oregon, R. F. D. 2	Dane.
Belda, William F.	DeForest	Dane.
Benson, Ed. E.	Mt. Horeb, R. 5	Dane.
Burr, H. R.	Marshall	Dane.
Chase, J. P.	Sun Prairie	Dane.
Chatterton, R. W.	Basco	Dane.
Chynoweth, H. E.	Madison, R. F. D.	Dane.
Dreger, E. L.	Madison, R. 7	Dane.
Emery, S. L.	Edgerton, R 2	Dane.
Ford, J. F.	Mazomanie, R. F. D.	Dane.
Gangstad, J. O.	Deerfield	Dane.
Gillette, R. A.	Verona	Dane.
Hill, Otto C.	Mt. Horeb	Dane.
Hillier, H. B.	Waunakee	Dane.
Kaltenberg, Anthony	Waunakee	Dane.
Koltes, Jos. F.	Dane, R. 87	Dane.
Maeder, J. W.	Oregon R. F. D. 3	Dane.
Meyer, John	Madison, R. F. D. 7	Dane.
Mitchell, J. T.	Cottage Grove	Dane.
Moen, Herman	Cambridge	Dane.

Oderbrucker Barley (Wisconsin No. 55).

Name of grower.	Address.	County.
Norsman, Jerome O....	Madison, R. F. D.....	Dane.
Peck, H. M.....	Marshall	Dane.
Reindahl, A. K.....	Madison, R. 2.....	Dane.
Renk, H. J.....	Sun Prairie.....	Dane.
Semb, T. A.....	Madison, R. 6.....	Dane.
Stewart J. R.....	Verona	Dane.
Thompson, Melvin.....	Mt. Horeb.....	Dane.
Thorstad, N. H.....	Deerfield	Dane.
Torgerson, B. S.....	Cottage Grove.....	Dane.
Von Lanyi, Oscar.....	Edgerton, R. 2.....	Dane.
Voss, William.....	Mazomanie	Dane.
Wernick, William H...	DeForest	Dane.
Wrabetz, Frank.....	Madison, R. 6.....	Dane.
Zabel, Edward.....	Deerfield	Dane.
Beule, Elmore A.....	Fox Lake.....	Dodge.
Bohl, Joseph N.....	Beaver Dam.....	Dodge.
Bussewitz, Orla J.....	Juneau	Dodge.
Ehrhardt, Daniel	Knowles	Dodge.
Ellison, Chas. J.....	Rubicon, R. F. D.....	Dodge.
Goetsch, Albert A.....	Juneau	Dodge.
Grebe, Fred P.....	Fox Lake.....	Dodge.
Howitt, Chas. H.....	Randolph	Dodge.
Howland, W. L.....	Waupun	Dodge.
Joice, George E.....	Waterloo	Dodge.
Jones. John G.....	Beaver Dam, R. 4.....	Dodge.
Jones, Owen Jr.....	Beaver Dam.....	Dodge.
Irving, J. W.....	Randolph	Dodge.
Krueger, Henry E....	Beaver Dam, R. 1....	Dodge.
Lehmann, Mrs. Eva....	Neosho	Dodge.
Mahoney. David.....	Juneau	Dodge.
Schultz, Edwin W.....	Brownsville	Dodge.
Weston, John.....	Burnett Jct.....	Dodge.
Boucsein, Ernie F.....	Detroit Harbor.....	Door.
Boucsein, Gus.....	Detroit Harbor.....	Door.
Buschman, Hugo	Forestville	Door.
Erickson, Ole C.....	Detroit Harbor.....	Door.
Hansen, Ole C.....	Detroit Harbor.....	Door.
Oldenburg, Gustav H.	Bailey's Harbor	Door.
Millar, Will.....	Menomonie	Dunn.
Allen, Chas. L.....	Eau Claire	Eau Claire.
Donaldson, H. A.....	Eau Claire, R. 3.....	Eau Claire.
Hine, Geo. S.....	Fairchild	Eau Claire.
Kenz, John Sr.....	Fairchild R. 2.....	Eau Claire.
Russell, A. C.....	Augusta	Eau Claire.
Winter, L. H.....	Eau Claire, R. 4.....	Eau Claire.
Wright, Wray C.....	Eau Claire, Box 195...	Eau Claire.
Beyer, Herman.....	Peebles, R. 37.....	Fond du Lac.
Bonzelet, J. P.....	Eden	Fond du Lac.
Briggs, J. W.....	Peebles	Fond du Lac.
Hinz, A. F.....	Ripon	Fond du Lac.
Jacky, Gilbert	Malone, R. 39.....	Fond du Lac.
Jacky, H. L.....	Malone, R. 39.....	Fond du Lac.
Kuehn, Charles A.....	Brandon	Fond du Lac.

Oderbrucker Barley (Wisconsin No. 55).

Name of grower.	Address.	County.
Meekin, H. W.	Fond du Lac	Fond du Lac.
Michels, Henry	Malone, R. 39	Fond du Lac.
Michels, Math.	Malone, R. 39	Fond du Lac.
Sheldon, B. F.	Brandon	Fond du Lac.
Stroup, Fred G.	Fond du Lac	Fond du Lac.
Whittaker, Horace	Fond du Lac	Fond du Lac.
Barron, R. E.	Platteville	Grant.
Bennett, Ora F.	Glen Haven	Grant.
Booth, Guy A.	Cuba City	Grant.
Fruit, Bert L.	Platteville	Grant.
Patterson, J. L.	Glen Haven	Grant.
Runde, Martin C.	Cuba City	Grant.
Rundell, Dale E.	Livingston	Grant.
Rundell, Wilbur M.	Livingston	Grant.
Stivarius, Geo. A.	Fennimore, R. 4	Grant.
Vosberg, H. L.	Louisberg, R. 2	Grant.
Bechtolt, A. B.	Browntown	Green.
Bechtolt, James J.	Monroe	Green
Biglow L. F.	Brooklyn	Green.
Mau, H. G.	Brodhead, R. 1	Green.
Murdock, C. R.	Brodhead	Green.
Olson, William	Browntown	Green.
Smiley, Jas. B.	Albany	Green.
Clark, Clarence	Markesan, R. 5	Green Lake.
Miller, Guy E. Jr.	Markesan	Green Lake.
Aavang, H. O.	Barneveld	Iowa.
Callicut, Harry	Mineral Point	Iowa.
Gordon, Archie L.	Mineral Point	Iowa.
Grimstad, A. C.	Barneveld	Iowa.
Lloyd-Jones, Enos	Hillside	Iowa.
Osborne, John F.	Linden	Iowa.
Osborne, W. F.	Linden	Iowa.
Paulson Hilbert	Hollandale	Iowa.
Ruggles, William Guy.	Ridgeway	Iowa.
Curran, W. F.	Taylor	Jackson.
Dettinger, Wm. F.	Hixton	Jackson.
Clemit, Adolph	Cambridge	Jefferson.
Hetts, Eugene	Ft. Atkinson	Jefferson.
Krueger, Alexander	Watertown, R 2	Jefferson.
Main, H. A.	Ft. Atkinson	Jefferson.
Markey, W. E.	Sullivan	Jefferson.
Mathews, Milton D.	Helenville	Jefferson.
McIntyre, Ivan	Ft. Atkinson	Jefferson.
Parsons, Wm. A.	Ft. Atkinson, R. 2	Jefferson.
Ward, W. Rodell.	Ft. Atkinson, R. 1	Jefferson.
Bailey, Earl H.	Elroy	Juneau.
Hanzlik, David E.	Wonewoc	Juneau.
Hanzlik, Otto J.	Wonewoc	Juneau.
Lannon, James H.	Lyndon Sta.	Juneau.
McNown, J. H.	Mauston	Juneau.
Wagner, J. M.	Union Center, R. 1	Juneau.
Wick, William F.	Mauston	Juneau.
Bradley, J. Frank	Somers	Kenosha.

Oderbrucker Barley (Wisconsin No. 55).

Name of grower.	Address.	County.
Brook, J. W.	Salem, R. 1	Kenosha.
Myrick, M. O.	Bristol	Kenosha.
Collin, D. W.	Luxemburg	Kewaunee.
Engel, Philip	Luxemburg	Kewaunee.
Jirtle, Geo. B.	Algoma	Kewaunee.
Katel, William	Kewaune ,R. 1	Kewaunee.
Raether, Louis J.	Algoma	Kewaunee.
Ray, William F.	Kewaunee, R. 1	Kewaunee.
Smithwick, James	Kewaunee, R. 6	Kewaunee
Harr, Ernest B.	Bangor	La Crosse.
Hass, Reinhold A.	La Crosse, R. 1	La Crosse.
Jewett, Harry	Bangor	La Crosse.
White, Glenn	La Crosse	La Crosse.
Akins, Clyde	Warren, Ill	LaFayette.
Andrews, Arthur	South Wayne	LaFayette.
Buss, Will G.	Mineral Point	LaFayette.
Glindinning, H. L.	Shullsburg	LaFayette.
Jensen, Peter	Argyle	LaFayette.
Usher, Earl	South Wayne	LaFayette.
Vinger, George	Argyle	LaFayette.
Vinger, Milo J.	Argyle	LaFayette.
Welton, Seth	Woodford	LaFayette.
Byerly, Edmund A.	Antigo	Langlade.
Bruhn, John T.	Mishicot, R. 3	Manitowoc.
Heidemann, Otto C.	Kiel, R. 2	Manitowoc.
Heyroth, Louis H.	Mishicot	Manitowoc.
Roethel, Herman	Kiel	Manitowoc.
Schwantes, Ernest E.	Two Rivers	Manitowoc.
Straka, Edward E.	Kellnersville, R. 2	Manitowoc.
Sullivan, James A.	Grimms	Manitowoc.
Strowig, William A.	Cleveland, R. 1	Manitowoc.
Wiegand, Otto R.	Cleveland, R. 2	Manitowoc.
Wilkowske, R. T.	Mishicot	Manitowoc.
Falarsh, Frank	Peshtigo	Marinette.
Olson, Otto W.	Walsh	Marinette.
Houslet, Neal	Packwaukee	Marquette.
Dennison, Nicholas	No. Milwaukee, R. 10.	Milwaukee.
Foley, Robert	Wauwatosa	Milwaukee.
Kurtze, Otto C.	West Allis, R. 15	Milwaukee.
Neilson, William C.	No. Milwaukee, R. 10.	Milwaukee.
Pauly, H. J.	Milwaukee, 207 14th st	Milwaukee.
Pierner Fred	No. Milwaukee, R. 11	Milwaukee.
Schlapman, T. W.	No. Milwaukee, R. 10.	Milwaukee.
Schmit, Peter	Granville	Milwaukee.
Southcott, Fred	Wauwatosa	Milwaukee.
Ebert, Francis E.	Tomah	Monroe.
Harris, Roy T.	Warrens	Monroe.
Harris, Ruthven E.	Warrens	Monroe.
Howell, Horace P.	Sparta	Monroe.
Whitehead, H. W.	Leon	Monroe.
Kohne, Henry	Little Suamico	Oconto.
Knoke, E. A.	Shiocton	Outagamie.
Jamison, Robert	Appleton, R. 2	Outagamie.

Oderbrucker Barley (Wisconsin No. 55).

Name of grower.	Address.	County.
Main, A. G.	Hortonville, R. 21.	Outagamie.
Merkel, Henry	Appleton	Outagamie.
Mueller, Edward O.	Appleton, R 1.	Outagamie.
Ryan, Malachi	South Kaukauna	Outagamie.
Schmit, A. N.	Appleton, R. 2	Outagamie.
Schmit, John A.	Hortonville, R. 22	Outagamie.
Siegert, A.	Appleton	Outagamie.
Sylvester, Walter W.	Seymour	Outagamie.
Wussow, Chas. A.	Seymour, R. 35	Outagamie.
Clausing, Adolph	Thiensville	Ozaukee.
Pierner, J. W.	Thiensville	Ozaukee.
Fleishauer, C. K.	Arkansaw	Pepin.
Hicks, Earl S.	Pepin	Pepin.
Scheid, Byron	Bay City	Pierce.
Christensen, Herman	Milltown	Polk.
Nelson, Peter C.	Milltown	Polk.
Sorenson, Albert E.	Osceola	Polk.
Tretsven, Oscar	Milltown	Polk.
Hanson, N. P.	Amherst Jct., R. 1.	Portage.
Swenson, O. S.	Amherst Jct., R. 1.	Portage.
Rasmussen, G. S.	Franksville, R. 9.	Racine.
Buehler, J. G.	Twin Bluffs	Richland.
Martin, H. A.	Gotham	Richland.
Post, Harry L.	Sextonville	Richland.
Welsh, S. L.	Tavera	Richland.
Acker, James	Milton	Rock.
Austin, W. B.	Janesville	Rock.
Benedict, E. L.	Beloit	Rock.
Dougan, W. J.	Beloit	Rock.
Fish, Esli	Janesville, R. 7	Rock.
Fisher, Clayton E.	Evansville, R. 17.	Rock.
Fisher, Joseph	Evansville, R. 17.	Rock.
Fisher, J. H.	Janesville	Rock.
Hoague, Charlie	Janesville R. 7.	Rock.
Marston, Albert	Beloit	Rock.
Nelson, Martin	Milton	Rock.
Newhouse, K. K.	Clinton	Rock.
Pitt, Ernest H	Milton	Rock.
Snyder, R. B.	Clinton	Rock.
Beebe, A. G.	Bruce	Rusk.
Batten, S. E.	Hudson	St. Croix.
Bennett, William L.	New Richmond	St. Croix.
Imholt, B. A.	Houlton	St. Croix.
Schwandt, Will	Stanton, Box 10.	St. Croix.
Accola, J. H.	Prairie du Sac	Sauk.
Clavadatscher, T.	Sauk City	Sauk.
Frederickson, Fred	Spring Green	Sauk.
Gallagher, Frank	Reedsburg	Sauk.
Gross, Waldo E.	Merrimac	Sauk.
Hudson, Dwight	Reedsburg	Sauk.
Lachmund, Robert	Sauk City	Sauk.
Marshall, William S.	Delton	Sauk.
Ochsner, Arthur C.	Plain	Sauk.

Oderbrucker Barley (Wisconsin No. 55).

Name of grower.	Address.	County.
Schoephorster, Henry..	Prairie du Sac.....	Sauk.
Toole, W. A.	Baraboo	Sauk.
Volz, Robert	Ableman	Sauk.
Thulin, Edwin	Hayward	Sawyer.
Hildemann, E. S.	Belle Plaine.....	Shawano.
Klovdahl, John J.	Wittenberg	Shawano.
Becker, P. V.	Plymouth	Sheboygan.
Blonien, Peter	Elkhart	Sheboygan.
Boll, John C.	Sheboygan Falls, R. 7	Sheboygan.
Dennerlein, Arthur J..	Plymouth, R. 28	Sheboygan.
Fischer, Louis H.....	Haven, R. 6	Sheboygan.
Frauenheim, O. R.....	Random Lake	Sheboygan.
Garside, Harry R.....	Cedar Grove	Sheboygan.
Hamann, Edgar	Sheboygan, R 1.....	Sheboygan.
Herdrich, S. F.....	Adell R. 19.....	Sheboygan.
Illian, William L.....	Adell R. 19.....	Sheboygan.
Liebzeit, Albert E.....	Sheboygan Falls	Sheboygan.
Parish, J. O.....	Plymouth	Sheboygan.
Sharpe, Chas. E.....	Waldo	Sheboygan.
Thackray, Joseph	Glenbeulah, R. 30.....	Sheboygan.
Chrysler, Harvey	Osseo	Trempealeau.
Dean, Robert	Eleva	Trempealeau.
Engleman, John	Galesville	Trempealeau.
Hagestad ,Andrew C. ..	Ettrick	Trempealeau.
Markham, Fred C.....	Independence	Trempealeau.
Mattison, Thomas	Blair	Trempealeau.
Moen, Gilbert T.....	Eleva	Trempealeau.
Raichle, Will	Galesville	Trempealeau.
Amott, A. L.....	Viroqua	Vernon.
Keir, S. M.....	Viroqua	Vernon.
Larsen, L. T.....	Viroqua	Vernon.
Nelson, Edwin	Viroqua	Vernon.
Parsch, Gustav A.....	Stoddard	Vernon.
Solverson, Oscar	Viroqua	Vernon.
Thiege, Edward G.....	Viroqua	Vernon.
Thiege, Karl J.....	Viroqua	Vernon.
Wagner, J. M.....	Union Center	Vernon.
Anderson. Alvin M.....	Whitewater	Walworth.
Downey, Urso J.....	Whitewater	Walworth.
Dunbar, Harry D.....	Elkhorn	Walworth.
Harris, Jesse S.....	Delavan	Walworth.
Howard. A. E.....	Whitewater	Walworth.
Kruse, William	Whitewater	Walworth.
Lean, R. J.....	Elkhorn	Walworth.
Lewis. Eri H.....	Whitewater	Walworth.
Lowell, Lloyd S.....	Sharon	Walworth.
Marck, L. G.....	Honey Creek	Walworth.
Peters, Ezra	Sharon	Walworth.
Stewart, Howard	Delavan, R. 2.....	Walworth.
Thacker, Ed. F.....	Zenda	Walworth.
West, Mark H.....	**Elkhorn .....**	Walworth.
Bast, Paul J.....	Rockfield	Washington.
O'Connell, James	Hartford	Washington.
Schottler, Conrad J....	So. Germantown	Washington.
Schroeder, H. F.....	**West Bend .....**	**Washington.**

Oderbrucker Barley (Wisconsin No. 55).

Name of grower.	Address.	County.
Blood, Ike	Mukwonago	Waukesha.
Evans, T. H.	Wales	Waukesha.
Haass, Otto	Merton	Waukesha.
Heffron, John A.	Big Bend	Waukesha.
Jacobson, F. E.	Oconomowoc	Waukesha.
Longley, H. N.	Dousman	Waukesha.
Rosenow Brothers	Oconomowoc	Waukesha.
Schafer, Chas. H.	Waukesha, R. 7	Waukesha.
Spaulding, C. F.	Oconomowoc	Waukesha.
Swan, L. W.	Mukwonago	Waukesha.
Swoboda, Frank G.	Dousman	Waukesha.
Williams, A. R.	Waukesha, R. 8	Waukesha.
Williams, David W.	Genesee Depot	Waukesha.
Burnham, D. F.	Waupaca, R. 6	Waupaca.
Hanson, Elmer	Waupaca, R. 1	Waupaca.
Kendall, Myron	Iola R. 3	Waupaca.
Kneipp, William	Weyauwega	Waupaca.
Larson, LeRoy	Iola	Waupaca.
Pope, N. J.	Iola	Waupaca.
Wall, Floyd	Weyauwega	Waupaca.
Anderson, Thomas E.	Wild Rose	Waushara.
Heuer, E. F.	Wautoma	Waushara.
Athearn, L. J.	Oshkosh	Winnebago.
Blakely, Albert J.	Neenah	Winnebago.
Blodgett, Gordon	[illegible]	Winnebago.
Harrison, Geo.	Omro	Winnebago.
Miller, Henry C.	Allenville	Winnebago.
Christensen, Peter W.	Marshfield, R. 3	Wood.
Clark, Charles F.	Babcock	Wood.
Crane, V. R.	St. Charles	Illinois.
Grimwood, Ivan J.	Bristol	Illinois.
Hitchcock, H. R.	Pecatonica	Illinois.
Keeney, E. R.	Rockton	Illinois.
Mathis, Adolph	Lansing, R. 1	Iowa.
Thompson, Thor, Jr.	Wadena	Iowa.
Meyer, A. J.	Howell, R. 7	Michigan.
Smith, J. G.	Farmington	Minnesota
Stienstra, Samuel	Swedesborg	Missouri.

Manshury Barley (Wisconsin No. 62).

Name of grower.	Address.	County.
Roeckel, Jos. P.....	Lark	Brown.
Houser, W. L.....	Mondovi	Buffalo.
Jahn, Chas.	Cream	Buffalo.
Muehleisen, Gottlieb ..	Tell	Buffalo.
Christoph, Theo. F....	Clinton	Calumet.
Chrisler, Harley E....	Lodi	Columbia.
Lloyd, Evan B.....	Cambria	Columbia.
Emery, S. L.....	Edgerton	Dane.
Fritz, Mark	Belleville	Dane.
Hopkins, S. Y.....	Basco	Dane.
Jordalen, Clarence.....	Stoughton	Dane.
Mitchell, J. T.....	Cottage Grove	Dane.
Von Lanyi, Oscar	Edgerton, R. 2.....	Dane.
Bohl, Joseph N.....	Beaver Dam	Dodge.
Krueger, Henry E....	Beaver Dam, R. 1....	Dodge.
Allen, Chas. L.....	Eau Claire	Eau Claire.
Donaldson, H. A.....	Eau Claire, R. 3.....	Eau Claire.
Russell, A. C.....	Augusta.....	Eau Claire.
Meekin, H. W.....	Fond du Lac	Fond du Lac.
Whittaker, Horace ...	Fond du Lac	Fond du Lac.
Fruit, Bert L.....	Platteville	Grant.
Marty, Matthias	Monticello, R. 1.....	Green.
Farwell, Roy R.....	Ridgeway	Iowa.
Grimstad, A. C.....	Barneveld	Iowa.
Merrill, W. M.....	Taylor	Jackson.
Moe, R. J.....	Holmen	La Crosse.
Thieleke, Edwin A....	Cleveland	Manitowoc.
Falarsh, Frank	Peshtigo	Marinette.
Nielson, William C....	No. Milwaukee, R. 10	Milwaukee.
Ahlers, Walter	Grafton	Ozaukee.
Gustafson, Theodore ..	Stockholm, R. 1.....	Pierce.
Tretsven, Oscar	Milltown	Polk.
Benedict, E. L.....	Beloit	Rock.
Frederickson, Fred ...	Spring Green.....	Sauk.
Becker, P. V.....	Plymouth	Sheboygan.
Fischer, Louis H.....	Haven, R. 6.....	Sheboygan.
Hagestad, Andrew C...	Ettrick	Trempealeau.
Parsch, Gustav A.....	Stoddard	Vernon.
Rosenow Bros.....	Oconomowoc	Waukesha.
Swan, L. W.....	Mukwonago	Waukesha.
Heinke, Alvin	New London	Waupaca.
Holman, R. M.....	Waupaca	Waupaca.
Johnson, A. O.....	Weyauwega	Waupaca.
Johnson, C. G.....	Clintonville, R. 1....	Waupaca.
Kneipp, Wm.....	Weyauwega	Waupaca.
Krostue, Julius	Sheridan	Waupaca.
Larson, Elmer J.....	Waupaca	Waupaca.
Zwicky, J. D.....	Scandinavia	Waupaca.
Hasselquist, Wm.....	Wild Rose, R. 2.....	Waushara.
Blakely, Albert J.....	Neenah	Winnebago.
Boss, S. J.....	Oshkosh, R. 7.....	Winnebago.
Cross, A. J.....	Allenville	Winnebago.
Walters, Andrew	Oshkosh, R. 1.....	Winnebago.
Lepien, John.....	Marshfield	Wood.

Manshury Bariey (Wisconsin No. 62).

Name of grower.	Address.	County.
Cooper, A. A.....	Elizabeth	Illinois.
Crane, V. R.....	St. Charles	Illinois.
Grimwood, Ivan J...	Bristol	Illinois.
Huebsch, L. A.....	Galena	Illinois.
Patterson, R. H.....	Durand	Illinois.
Kaiser, E. C.....	Garnavillo	Iowa.
Thompson, T., Jr.....	Wadena	Iowa.
Wirkler, A. J.....	Garnavillo	Iowa.

(*Wisconsin No. 7 corn.*)

Name of grower.	Address.	County.
Johnson, Billie.....	Strong's Prairie.....	Adams.
Walker, Ray C.....	Plainfield	Adams.
Nies, Peter.....	Greenleaf	Brown.
Roeckel, Jos. P.....	Lark	Brown.
Williams, L.....	Green Bay.....	Brown.
Bilderbach, W. T.....	Mondovi	Buffalo.
Houser, W. L.....	Mondovi	Buffalo.
Jahn, Chas.....	Cream	Buffalo.
Joos, Frank B.....	Fountain City.....	Buffalo.
Kindschy, George.....	Waumandee	Buffalo.
Muehleisen, Gottlieb...	Tell	Buffalo.
Spaulding, Leslie.....	Mondovi	Buffalo.
Stamm, G. A.....	Modena	Buffalo.
Suhr, Otto A.....	Cochrane	Buffalo.
Zeller, Louis.....	Waumandee	Buffalo.
Christoph, T. F.....	Chilton	Calumet.
Kircher, H. W.....	Chilton	Calumet.
Peterson, Henry N....	New Holstein.....	Calumet.
Whitby, Arthur J.....	Chilton, R. F. D. 5....	Calumet.
Bible, F. O.....	Chippewa Falls.....	Chippewa.
Hebert, Louis Paul....	Chippewa Falls.....	Chippewa.
Brooks, George R.....	Granton, R. F. D. 2..	Clark.
Miller, Theodore.....	Greenwood	Clark.
Capener, Howard H..	Portage	Columbia.
Chrisler, Elvin.....	Lodi, R. F. D. 1.....	Columbia.
Chrisler, Harley E....	Lodi	Columbia.
Ellickson, A. C.....	Arlington	Columbia.
Foster, Carl C.....	Fall River.....	Columbia.
Gloeckler, Theo.....	Portage	Columbia.
Grove, Christian.....	Columbus	Columbia.

(*Wisconsin No. 7 corn.*)

Name of grower.	Address	County.
Hanson, E. A.	Pardeeville	Columbia.
Jones, John R.	Columbus	Columbia.
Lloyd, Evan B.	Cambria	Columbia.
O'Connor, Edward F.	Lodi, R. F. D. 1	Columbia.
Phillips, F. M.	Wyocena	Columbia.
Sharpee, E. A.	Rio, R. F. D. 1	Columbia.
Sharpee, Johanes A.	Rio	Columbia.
Sharpee, P. A.	Rio	Columbia.
Steuber, L. J.	Lodi	Columbia.
Stewart, G. L.	Lodi	Columbia.
Hjelle, Ole K.	Soldiers Grove	Crawford.
Lam, Sam	Ferryville	Crawford.
Lawrence, W. J.	DeSoto	Crawford.
Nelson, T. E.	Ferryville	Crawford.
Young, Harry	Bridgeport	Crawford.
Bendickson, I. E.	Cambridge	Dane.
Birkrem, Clarence	Deerfield	Dane.
Birrenkott, M. J.	Klevenville	Dane.
Brigham, C. I.	Blue Mounds	Dane.
Burr, H. R.	Marshall	Dane.
Chase, J. P.	Sun Prairie	Dane.
Chatterton, R. W.	Basco	Dane.
Christianson, Peter	Deerfield	Dane.
Chynoweth, H. E.	Madison, R. F. D.	Dane.
Coldwell, John	Mazomanie	Dane.
Dahle, L. O.	Deerfield	Dane.
Daley, John	McFarland	Dane.
Elver, E. C.	Madison, R. F. D. 3	Dane.
Emery, S. L.	Edgerton	Dane.
Fadness, John	Deerfield	Dane.
Firitz, Mack	Belleville	Dane.
Flom, Martin O.	Stoughton	Dane.
Ford, J. F.	Mazomanie	Dane.
Gangstad, Herman O.	Deerfield	Dane.
Gillette, Rufus	Verona	Dane.
Harrington, C. E.	Verona	Dane.
Hill, Otto C.	Mt. Horeb	Dane.
Hillier, H. B.	Waunakee	Dane.
Holscher, A. C.	Cottage Grove	Dane.
Hopkins, S. Y.	Basco	Dane.
Hougan, O. O.	Stoughton	Dane.
Jordalen, Clarence	Stoughton	Dane.
Kaltenberg, Anthony	Waunakee	Dane.
Koltes, Jos. F.	Dane, R. 37	Dane.
Larson, T. D.	Cambridge	Dane.
Lee, Severt A.	Deerfield	Dane.
Lee, Tollaf	Klevenville	Dane.
Maeder, J. W.	Oregon	Dane.
Mielke, J. E.	Basco	Dane.
Mikkelson, Carl	Deerfield	Dane.
Nicholls, Henry	Stoughton	Dane.
Noyce, Elmer J.	Oregon	Dane.
Peck, H. M.	Marshall	Dane.

(*Wisconsin No. 7 corn.*)

Name of grower.	Address.	County.
Prescott, J. O.....	Deerfield	Dane.
Reindahl, A. K.....	Madison	Dane.
Richardson, Leonard C	Oregon	Dane.
Royston, Thos.....	Mazomanie	Dane.
Ruste, C. O.....	Blue Mounds	Dane.
Semb, T. A.....	Madison, R. F. D. 6...	Dane.
Sanborn, E. H.....	Madison	Dane.
Showers, E. W.....	Cottage Grove.....	Dane.
Stromness, M. A.....	Cambridge	Dane.
Swalem, P. O.....	DeForest	Dane.
Swenson, Gust.....	Deerfield	Dane.
Teisberg, Samuel H...	Stoughton	Dane.
Thompson, Melvin.....	Mt. Horeb	Dane.
Thorstad, Nels H.....	Deerfield	Dane.
Trow, E. J.....	Oregon	Dane.
Wernick, A. C.....	Morrisonville	Dane.
Winegar, A. B.....	Madison, R. F. D.....	Dane.
Wrabetz, Frank.....	Madison, R. 6.....	Dane.
Beule, Elmore A.....	Fox Lake.....	Dodge.
Brooks, Jos.....	Watertown	Dodge.
Bohl, Joseph N.....	Beaver Dam.....	Dodge.
Ellison, Chas. J.....	Rubicon	Dodge.
Grebe, Fred P.....	Fox Lake.....	Dodge.
Goetsch, Albert A.....	Juneau	Dodge.
Jones, John G.....	Beaver Dam.....	Dodge.
Jones, John R.....	Columbus	Dodge.
Jones, Owen Jr.....	Beaver Dam.....	Dodge.
Krueger, Henry E.....	Beaver Dam.....	Dodge.
Lehmann, T. A.....	Watertown	Dodge.
Lehmann, Mrs. Eva...	Neosho	Dodge.
Mahoney, David.....	Juneau	Dodge.
Owens, Herbert O.....	Fox Lake.....	Dodge.
Roberts, Thos. J.....	Randolph	Dodge.
Roberts, William E....	Randolph	Dodge.
Schiller, Claude E....	Beaver Dam, R.F.D. 4	Dodge.
Schultz, Edwin W.....	Brownsville	Dodge.
Lindberg, Emil.....	Itasca Sta.....	Douglas.
Allen, Chas. L.....	Eau Claire	Eau Claire.
Boernke, Rudolph	Fall Creek.....	Eau Claire.
Coon, Leslie E.....	Osseo	Eau Claire.
Fear, E. F.....	Augusta	Eau Claire.
Germann, Henry L....	Brackett	Eau Claire.
Konz, John Sr.....	Fairchild	Eau Claire.
Krogstad, Oscar J.....	Eau Claire, R. 4.....	Eau Claire.
Oliver, C. S.....	Eau Claire.....	Eau Claire.
Ristau, Edward.....	Osseo	Eau Claire.
Winter, L. H.....	Eau Claire, R. 4.....	Eau Claire.
Wright, Geo. T.....	Eau Claire, Box 195..	Eau Claire.
Wright, Wray C.....	Eau Claire, Box 195..	Eau Claire.
Bonzelet, J. P.....	Eden	Fond du Lac.
Briggs, J. W.....	Peebles	Fond du Lac.
Brunson, Levi E.....	Rosendale	Fond du Lac.

(*Wisconsin No. 7 corn.*)

Name of grower.	Address.	County.
Buck, Clarence W....	Eldorado	Fond du Lac.
Carpenter, Leon A....	Fond du Lac.....	Fond du Lac.
Day, James.....	Oakfield	Fond du Lac.
Gibbard, P. J.....	Ripon	Fond du Lac.
Hinz, A. F.....	Ripon	Fond du Lac.
Krause, Edward H....	Ripon, R. 13.....	Fond du Lac.
Kuehn, Charles A.....	Brandon	Fond du Lac.
Maug, Arthur J.....	Ripon	Fond du Lac.
Meekin, H. W.....	Fond du Lac.....	Fond du Lac.
Michels, Henry.....	Malone, R. 39.....	Fond du Lac.
Miritz, O. F.....	Fond du Lac.....	Fond du Lac.
Monroe, Royal.....	Fond du Lac, R. 3...	Fond du Lac.
Monroe, S. Ferris.....	Rosendale, R. 12.....	Fond du Lac.
Northrup, J. V.....	Waupun	Fond du Lac.
Oleson, Janes P.....	Ripon, R. 13.....	Fond du Lac.
Phillips, Sidney.....	Eldorado	Fond du Lac.
Welles, M. L.....	Rosendale	Fond du Lac.
Whittaker, Horace.....	Fond du Lac.....	Fond du Lac.
Bennett, Ora F.....	Glen Haven.....	Grant.
[illegible], J. W.....	Fennimore	Grant.
Bryant, R. J.....	Hazel Green.....	Grant.
Carmody, P. J.....	Mt. Ida	Grant.
Cuheld, F. H.....	Potosi	Grant.
Fruit, Bert L.....	Platteville	Grant.
Gelbach, Parke R.....	Lancaster	Grant.
Kramer, John Sr.....	Montfort	Grant.
Rundell, Dale E.....	Livingston	Grant.
Stivarius, Geo. A.....	Fennimore	Grant.
Vosberg, Henry L.....	Hazel Green	Grant.
Wayne, Joseph	Boscobel	Grant.
Wiseman, Paul	Bridgeport	Grant.
Young, Harry	Bridgeport	Grant.
Bechtolt, A. B.....	Browntown	Green.
Bechtolt, James D.....	Monroe	Green.
Biglow, L. F.....	Brooklyn	Green.
Murdock, C. R.....	Brodhead	Green.
Marty, Matthias.....	Monticello	Green.
Mau, H. G.....	Brodhead, R. 1.....	Green.
Aavang, H. O.....	Barneveld	Iowa.
Baker, Dwight.....	Blanchardville	Iowa.
Bennett, J. Harrie.....	Mineral Point.....	Iowa.
Blotz, Elmer.....	Dodgeville	Iowa.
Caldwell, John.....	Mazomanie, R. F. D..	Iowa.
Caygill, Fred M.....	Linden	Iowa.
Farwell, Ray.....	Ridgeway	Iowa.
Gordon, J. Roy.....	Mineral Point	Iowa.
Grimstad, A. C.....	Barneveld	Iowa.
Kitchen, Jos. H.....	Edmund	Iowa.
LeGresley, Morris.....	Hillside	Iowa.
Ley, John B.....	Dodgeville	Iowa.
Lloyd-Jones, Chas....	Hillside	Iowa.
Osborne, John F.....	Linden	Iowa.
Osborne, W. F.....	Linden	Iowa.

(*Wisconsin No. 7 corn.*)

Name of grower.	Address.	County.
Thomas, Roy E.....	Dodgeville	Iowa.
Dietrich, John J.....	Black River Falls....	Jackson.
Koehler, Will.....	Hixton	Jackson.
Merrill, Waldo M.....	Taylor	Jackson.
Somerville, Robert....	Melrose	Jackson.
Tibbitts, William.....	North Bend.....	Jackson.
Emmert, H. L.....	Johnson Creek, R. 2..	Jefferson.
Graper, Edwin J.....	Helenville, R. 1.....	Jefferson.
Hetts, Engene.....	Ft. Atkinson	Jefferson.
Hetts, J. D.....	Ft. Atkinson	Jefferson.
Howard, Geo. A.....	Ft. Atkinson	Jefferson.
Lehmann, Theo.....	Watertown, R. 1.....	Jefferson.
Main, H. A.....	Ft. Atkinson	Jefferson.
Markey, Walter.....	Sullivan	Jefferson.
McIntyre, Ivan.....	Ft. Atkinson	Jefferson.
Mullen, Timothy	Watertown	Jefferson.
Parsons, William A...	Ft. Atkinson	Jefferson.
Ward, W. Rodell.....	Ft. Atkinson, R. 1....	Jefferson.
Lannon, James H.....	Lyndon Sta.....	Juneau.
McNown, J. H.....	Mauston	Juneau.
Wagner, J. M.....	Union Center, R. 1....	Juneau.
Bradley, Frank	Somers	Kenosha.
Brook, J. W.....	Salem, R. 1.....	Kenosha.
Holloway, John W.....	Union Grove	Kenosha.
Myrick, M. O.....	Bristol	Kenosha.
Peterson, A. J.....	Bristol, R. 31.....	Kenosha.
Thiers, L. M.....	Kenosha	Kenosha.
Cherveny, Wenzel	Kewaunee, R. 2.....	Kewaunee.
Collin, D. W.....	Luxemburg	Kewaunee.
Raether, Louis J.....	Algoma	Kewaunee.
Ray, William F.....	Kewaunee, R. 6.....	Kewaunee.
Smithwick, Jas.....	Kewaunee, R. 6.....	Kewaunee.
Bonsack, Herman M...	LaCrosse	LaCrosse.
Bowden, Chas. B.....	West Salem	LaCrosse.
Fulton, Willard A.....	Bangor	LaCrosse.
Griswold. H. W.....	West Salem	LaCrosse.
Harr, Ernest.....	Bangor	LaCrosse.
Hemker, Fritz H.....	West Salem	LaCrosse.
Hemker, Fritz F.....	LaCrosse	LaCrosse.
Herold, Rudolph	Stoddard	LaCrosse.
Moe, R. J.....	Holmen	LaCrosse.
Muttelman, Fred	West Salem	LaCrosse.
Sandman, W. D.....	Holmen	LaCrosse.
Streeton, Enos	Bangor	LaCrosse.
Streeton, Jabez	Bangor	LaCrosse.
Andrews, Arthur	South Wayne	LaFayette.
Jensen, Peter	Argyle	LaFayette.
Ruskell, Emmet	Belmont	LaFayette.
Stewart, J. W.....	Blanchardville	LaFayette.
Tenney, Horatio A....	Calamine	LaFayette.
Vinger, George	Argyle	LaFayette.
Frelich, Albert	Kellnersville	Manitowoc.
Gintner, Joe.....	Reedsville, R. 2.....	Manitowoc.

(*Wisconsin No. 7 corn.*)

Name of grower.	Address.	County.
Heidemann, Otto C....	Kiel, R. 2.....	Manitowoc.
Klann, Adolph	Hayton, R. 1.....	Manitowoc.
Roethel, Herman	Kiel	Manitowoc.
Salzman, Ed.....	Kiel	Manitowoc.
Straka, Edward E.....	Keilnersville	Manitowoc.
Sullivan, Jas. A.....	Grimms	Manitowoc.
Thieleke, Ed. A.....	Cleveland, R. 2.....	Manitowoc.
Thieleke, T. T.....	Kiel	Manitowoc.
Haskins, Leon	Montello	Marquette.
Dennison, Nicholas....	No. Milwaukee	Milwaukee.
Ernst, John A.....	Milwaukee, 644-7th St.	Milwaukee.
Hardy, John.....	Wauwatosa	Milwaukee.
Jante, Henry H.....	Milwaukee, Sta. A. R.4	Milwaukee.
Kurtze, Otto C.....	West Allis, R. 15....	Milwaukee.
Neilson, William C....	No. Milwaukee, R. 10.	Milwaukee.
Siegert, Joseph	Granville	Milwaukee.
Sievers, George.....	No. Milwaukee, R. 9.	Milwaukee.
Vollmer, Theo. F.....	Milwaukee, Sta. D...	Milwaukee.
Brunson, Hans	Melvin	Monroe.
Ebert, Francis, E.....	Tomah	Monroe.
Fox, C. L.....	Leon	Monroe.
Freeman, G. A.....	Sparta	Monroe.
Hanchett, W. H.....	Sparta	Monroe.
Johnson, George.....	Cataract	Monroe.
Leverich, J. W.....	Sparta	Monroe.
Molley, Martin.....	Ontario	Monroe.
Nathen, Paul R.....	Kendall	Monroe.
Whitehead, Henry W..	Leon	Monroe.
Wilkinson, Edw.....	Wilton	Monroe.
Wyatt, Ray L.....	Tomah	Monroe.
Kohne, Henry.....	Little Suamico.....	Oconto.
Jamison, Robert.....	Appleton, R. 2.....	Outagamie.
Letts, Edward F.....	Appleton	Outagamie.
Mueller, Edw. O.....	Appleton, R. 1.....	Outagamie.
Ryan, Malachi	So. Kaukauna.....	Outagamie.
Schmit, Alois E.....	Hortonville, R. 22....	Outagamie.
Schmit, A. W.....	Appleton, R. 2.....	Outagamie.
Schmit, George.....	Greenville, R. 16.....	Outagamie.
Siegert, A.....	Appleton	Outagamie.
Tesch, Arthur.....	Seymour, R. 36.....	Outagamie.
Ahlers, Walter	Grafton	Ozaukee.
Kurtz, Chas. J.....	Saukville	Ozaukee.
Pattison, Thos. J.....	Durand	Pepin.
Paulson, Gust.....	Clayton	Polk.
Peterson, August	Amery, R. 4.....	Polk.
Uhlin, Frank E.....	Clayton	Polk.
Adler, William	Amherst Jct., R. 1....	Portage.
Hanson, N. P.....	Amherst Jct., R. 1....	Portage.
Mjelde, Louis	Amherst	Portage.
Peterson, Perry O.....	Amherst, R. 2.....	Portage.
Skoglund, Louis.....	Amherst	Portage.
Adland, P. H.....	North Cape	Racine.
Cooney, Martin.....	Corliss	Racine.

(*Wisconsin No. 7 corn.*)

Name of grower.	Address.	County.
Freeman, Roy F.	Racine, R. 4	Racine.
Klofanda, Reuben	Racine	Racine.
Peterka, Joseph	Racine, R. 7	Racine.
Rasmussen, Gordon S.	Franksville, R. 9	Racine.
Roberts, R. E.	Corliss	Racine.
Wilson, W. C.	Burlington	Racine.
Buehler, J. G.	Twin Bluffs	Richland.
Ghastin, Wm. J.	Twin Bluffs	Richland.
Jaquish, J. E.	Twin Bluffs	Richland.
Monson, Chris	Five Points	Richland.
Post, Harry L.	Sextonville	Richland.
Welsh, S. L.	Tavera	Richland.
Acker, J. B.	Milton	Richland.
Bleasdale, Joseph B.	Janesville, R. 5	Rock.
Crandall, W. Truman	Milton	Rock.
Dougan, W. J.	Beloit	Rock.
Fish, Esli	Janesville, R. 7	Rock.
Fisher, Clayton E.	Evansville, R. 17	Rock.
Gabrill, E.	Evansville	Rock.
Hoague, Charles C.	Janesville, R. 7	Rock.
Howe, Louis H.	Brodhead	Rock.
Jacobson, Iven	Clinton	Rock.
Jacobson, Louis M.	Clinton	Rock.
Kimble, N. G.	Milton Junction	Rock.
Lunde, K. I.	Edgerton	Rock.
Newhouse, K. K.	Clinton	Rock.
Peterson, Theodore A.	Orfordville	Rock.
Porter, Joseph K.	Evansville	Rock.
Porter, W. B.	Evansville	Rock.
Snyder, R. B.	Clinton	Rock.
Christensen, C. W.	Roberts	St. Croix.
Imholt, B. A.	Houlton	St. Croix.
Frederickson, Fred.	Spring Green	Sauk.
Gross, Waldo E.	Merrimac	Sauk.
Hudson, Dwight	Reedsburg	Sauk.
Lachmund, Robert	Sauk City	Sauk.
Marshall, William S.	Delton	Sauk.
Ochsner, Arthur C.	Plaine	Sauk.
Saxe, William	Baraboo	Sauk.
Schneller, Geo. L.	Plaine	Sauk.
Steidtmann, Edwin	Prairie du Sac	Sauk.
Vonder Ohe, William H.	Reedsburg	Sauk.
Wichern, Carl W.	Baraboo	Sauk.
Waterstreet, Wm.	Spring Green	Sauk.
Harriman, Fred E. Jr.	Shawano, R. 2	Shawano.
Hildemann, E. S.	Belle Plaine	Shawano.
Jahnke, Herman F.	Regina	Shawano.
Garside, Harry R.	Cedar Grove	Sheboygan.
Illian, William L.	Adell, R. 19	Sheboygan.
Leonard, Mike	Plymouth	Sheboygan.
Melvin, R. B.	Glenbeulah	Sheboygan.
Schaefer, Henry G.	Plymouth	Sheboygan.
Sharpe, Charles E.	Waldo	Sheboygan.

(*Wisconsin No. 7 corn.*)

Name of grower.	Address.	County.
Thackray, T. H.	Glenbeulah	Sheboygan.
Engleman, J. P.	Galesville	Trempealeau.
Erickson, Christ.	Ettrick	Trempealeau.
Frase, Henry E.	Osseo	Trempealeau.
Hagestad, Andrew C.	Ettrick	Trempealeau.
Pederson, Peter	Eleva	Trempealeau.
Peterson, O. P.	Blair	Trempealeau.
Raichle, Will.	Galesville	Trempealeau.
Warner, R. C.	Whitehall	Trempealeau.
Wold, Oscar.	Eleva	Trempealeau.
Brye, Lewis O.	Coon Valley	Vernon.
Call, H. H.	West Prairie	Vernon.
Dahlen, Melvin O.	Coon Valley	Vernon.
Haverley, H. L.	Victory	Vernon.
Johnson, Thomas.	Westby, R. 4	Vernon.
Lindevig, K. T.	Westby	Vernon.
Olson, G. C.	Westby	Vernon.
Rundahl, J. K.	Coon Valley	Vernon.
Thiege, Karl J.	Viroqua	Vernon.
Thiege, M. G.	Westby	Vernon.
Anderson, Alvin M.	Whitewater	Walworth.
Benson, Bryant S. Jr.	Genoa Jct.	Walworth.
Brady, James F.	Whitewater	Walworth.
Downey, Stanley A.	Whitewater	Walworth.
Downey, U. J.	Whitewater	Walworth.
Meurer, Paul, Jr.	Genoa Junction	Walworth.
Peterson, E. C.	Whitewater, R. 4	Walworth.
Schwartz, Walter W.	Troy Center	Walworth.
Tacher, E. T.	Zenda	Walworth.
West, Mark H.	Elkhorn, R. 1	Walworth.
Bast, Paul J.	Rockfield	Washington.
Motz, Walter	Colgate	Washington.
Puls, John	Hartford	Washington.
Schottler, Conrad J.	So. Germantown	Washington.
Schroeder, Herbert F.	West Bend	Washington.
Carmichael, Allen	Waukesha, R. 2	Waukesha.
Carroll, W. P.	Wales	Waukesha.
Greengo, A. L.	Menomonee Falls	Waukesha.
Haass, Otto	Merton	Waukesha.
Jenkins, Robert	Wales	Waukesha.
Jens, Otto A.	Waukesha, R. 9	Waukesha.
Jones, Albert	Dousman	Waukesha.
Longley, H. N.	Dousman	Waukesha.
McRandles, J.	Waukesha, R. 5	Waukesha.
Metweede, Henry.	Waukesha	Waukesha.
Pritchand, John T.	Waukesha	Waukesha.
Rosenow Bros.	Oconomowoc	Waukesha.
Rowlands, R. W.	Waukesha	Waukesha.
Rust, Shirley	Mukwonago	Waukesha.
Shultis, A. D.	Waukesha, R. 1	Waukesha.
Spaulding, C. F.	Oconomowoc	Waukesha.
Spaulding, Willis H.	Oconomowoc	Waukesha.
Swoboda, Frank G.	Dousman	Waukesha.

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Name of grower.	Address.	County.
Williams, A. R.	Waukesha, R. 8	Waukesha.
Williams, John H.	Waukesha	Waukesha.
Williams, Orson P.	Waukesha	Waukesha.
Bestul, Otto A.	Scandinavia	Waupaca.
Hansen, Helmer	Scandinavia	Waupaca.
Heinke, Alvin	New London	Waupaca.
Hoffman, John	Clintonville	Waupaca.
Holman, Ray M.	Waupaca	Waupaca.
Kendall, Myron	Iola, R. 3	Waupaca.
Kneipp, William	Weyauwega	Waupaca.
Larson, Elmer J.	Waupaca	Waupaca.
Larson, LeRoy	Iola	Waupaca.
Pinkerton, J.	Waupaca	Waupaca.
Stratton, J. W.	Waupaca	Waupaca.
Zeimer, Fred.	New London	Waupaca.
Barr, Ellsworth	Pine River	Waushara.
Carey, Clinton	Redgranite	Waushara.
Carey, Henry	Pine River	Waushara.
Dopp, Walter H.	Wild Rose	Waushara.
Hasselquist, William	Wild Rose	Waushara.
Heuer, Edw. F.	Wautoma	Waushara.
Jacklin, Ben, Jr.	Redgranite	Waushara.
Jacklin, Harley	Redgranite, R. 1	Waushara.
Tice, Ray	Redgranite	Waushara.
Winge, William	Wautoma	Waushara.
Blakely, Albert J.	Neenah	Winnebago.
Cross, A. J.	Allenville	Winnebago.
Harrison, Geo.	Omro	Winnebago.
Kloehn, Irwin G.	Pickett	Winnebago.
Miller, Oren	Pickett	Winnebago.
Olson, Harry O.	Larsen	Winnebago.
Kieffer, J. C.	Auburndale	Wood.
Bennett, Herman J.	Belvidere	Illinois.
Bryson, Donald L.	Elizabeth	Illinois.
Cross, Roy H.	Davis	Illinois.
North, George	White Hall	Illinois.
Patterson, Roger H.	Durand	Illinois.
Pollock, W. H.	Lake Villa	Illinois.
Gimry, Carl H.	Grovertown, R. 1	Indiana.
Schulte, W. L.	Garnavillo	Iowa.
Meyer, A. J.	Howell, R. 7	Michigan.
Vandercook, R. I.	Linden, R. 2	Michigan.
Smith, J. G.	Farmington	Minnesota.

Wisconsin No. 8 corn.

Name of grower.	Address.	County.
Tomkins, O. Scott.....	Ashland, Box 304.....	Ashland.
Stevenson, J. W.....	Rice Lake.....	Barron.
Moergeli, Henry.....	Washburn	Bayfield.
Roeckel, Jos. P.....	Lark	Brown.
Roffers, John A.....	Green Bay, R. 7.....	Brown.
Loomis, Geo. E.....	Mondovi, R. F. D. 3..	Buffalo.
Christoph, Theo.	Chilton	Calumet.
Johnson, Albert I.....	Bloomer	Chippewa.
Kramer, Henry F.....	Bloomer	Chippewa.
Anderson, Milo C.....	Greenwood	Clark.
Peterson, William.....	Curtiss	Clark.
Schultz, Walter W.....	Neillsville	Clark.
Zerbel, H.....	Humbird	Clark.
Chrisler, Harley E....	Lodi	Columbia.
Barton, Otto.....	Mt. Horeb	Dane.
Fritz, Mark.....	Belleville	Dane.
Gillette, R. A.....	Verona	Dane.
Howitt, Chas. H.....	Randolph	Dodge.
Krueger, Henry E.....	Beaver Dam, R. 1....	Dodge.
Owens, H. C.....	Fox Lake.....	Dodge.
Birmingham, L. E.....	Sturgeon Bay	Door.
Boucsein, Gust	Detroit Harbor	Door.
Buschman, Hugo	Forestville	Door.
Erickson, Ole C.....	Detroit Harbor.....	Door.
Oldenburg, G. H.....	Bailey's Harbor	Door.
Orell, Leo J.....	Algoma, R. 4.....	Door.
Sullivan, J. J.....	Forestville	Door.
Allen, Chas. L.....	Eau Claire	Eau Claire.
Germann, Henry L....	Brackett	Eau Claire.
Hine, Geo. S.....	Fairchild	Eau Claire.
Konz, John Sr.....	Fairchild, R. 2.....	Eau Claire.
Russell, A. C.....	Augusta	Eau Claire.
Winter, L. H.....	Eau Claire, R. 4.....	Eau Claire.
Wright, Geo. T.....	Eau Claire, Box 195..	Eau Claire.
Wright, Wray C.....	Eau Claire, Box 195..	Eau Claire.
Bonzelet, J. P.....	Eden	Fond du Lac.
Briggs, J. W.....	Peebles	Fond du Lac.
Brunson, Levi E.	Rosendale	Fond du Lac.
Carpenter, L .A.....	Fond du Lac, R. 7....	Fond du Lac.
Hill, Chas. L.....	Rosendale	Fond du Lac.
Hinz, A. F.....	Ripon	Fond du Lac.
Jacky, Harvey L.	Malone, R. 39.....	Fond du Lac.
Krause, Edw. H.....	Ripon, R. 13.....	Fond du Lac.
Meekin, H. W.....	Fond du Lac.....	Fond du Lac.
Stroup, Fred G.....	Fond du Lac, R. 5....	Fond du Lac.
Whittaker, Horace ...	Fond du Lac.....	Fond du Lac.
Digman, Fred	Monroe	Green.
Clark, Clarence	Markesan, R. 5.....	Green Lake.
Miller, Guy E. Jr.....	Markesan	Green Lake.
Lloyd-Jones, Scott	Hillside	Iowa.
Dettinger, W. F.....	Hixton, R. 1.....	Jackson.
Jones, Thos. C.....	Watertown, R. 9.....	Jefferson.
Anderson, W. H.....	Elroy	**Juneau.**

Wisconsin No. 8 corn.

Name of grower.	Address.	County.
Burgess, E. H.	Bristol	Kenosha.
Jirtle, Geo. B.	Algoma	Kewaunee.
Smithwick, Jas.	Kewaunee, R. 6	Kewaunee.
Brandt, Chas., Jr.	West Salem	La Crosse.
Cameron, Duncan A.	La Crosse	La Crosse.
Mielder, B. W.	Midway	La Crosse.
Leverenz, Roy B.	Tomahawk	Lincoln.
Heidemann, Otto C.	Kiel, R. 2	Manitowoc.
Hoefner, William	Manitowoc, R. 2	Manitowoc.
Straka, Edward E.	Kellnersville	Manitowoc.
Sullivan, Jas. A.	Grimms	Manitowoc.
Wiegand, O. R.	Cleveland	Manitowoc.
Baesemann, Otto	Edgar, R. 2	Marathon.
Falarsh, Frank	Pesntigo	Marinette.
Olson, Otto W.	Walsh	Marinette.
Basse, William H.	Milwaukee, Sta. A, R. 4	Milwaukee.
Jungbluth, William J.	Milwaukee, Sta. A, R. 5	Milwaukee.
Kurtze, Otto C.	West Allis, R. 15	Milwaukee.
Schlapman, T W.	No. Milwaukee, R. 10	Milwaukee.
Schroeder, Hermann F	Milwaukee, Sta. D, R. 3	Milwaukee.
Whitnall, H. E.	Milwaukee, 573 Lake Drive.	Milwaukee.
Babcock, H. E.	Sparta	Monroe.
Ebert, Edmund D.	Tomah	Monroe.
Hubbard, E. S.	Norwalk	Monroe.
Leverich, J. W.	Sparta	Monroe.
Scholze, Theo. A.	Sparta	Monroe.
Kohne, Henry	Little Suamico	Oconto.
Merkel, Henry	Appleton	Outagamie
Mueller, Edw. O.	Appleton, R. 1	Outagamie
Ryan, Malachi.	So. Kaukauna	Outagamie
Port, Michael	Port Washington, R. 2	Ozaukee.
Wulff Fred	Grafton	Ozaukee.
Sorensen, Albert E.	Osceola	Polk.
Hanson, N. P.	Amherst Jct., R. 1	Portage.
Klussendorf, Fred E.	Phillips	Price.
Ford, Thos. R.	Caledonia, R. 12	Racine.
Furgasen, J. H.	Richland Center	**Richland.**
Bennett, William	New Richmond, R. 6	St. Croix.
Imholt, B. A.	Houlton	St. Croix.
Frederickson, Fred	Spring Green	Sauk.
Gross, Waldo E.	Merrimac	Sauk.
Lachmund, Robert	Sauk City	Sauk.
Schoephorster, Henry J.	Prairie du Sac	Sauk.
Volz, Robert E.	Ablemans	Sauk.
Hildemann, E. S.	Belle Plaine	Shawano.
Jahnke, Herman F.	Regina	Shawano.
Eastman, F. A.	Sheboygan Falls	Sheboygan.
Frauenheim, O. R.	Random Lake	Sheboygan.
Herdrich, S. F.	Adell, R. 19	Sheboygan.
Illian, W. L.	Adell	Sheboygan.
Sharpe, Chas. E.	Waldo	Sheboygan.

Wisconsin No. 8 corn.

Name of grower.	Address.	County.
Erickson, Christ.	Ettrick	Trempealeau.
Cass, Leonard	Viroqua	Vernon.
Berry, James G.	Birchwood	Washburn.
O'Connell, James	Hartfort	Washburn.
Haass, Otto	Merton	Waukesha.
Hicken, A. B.	Waukesha, R. 7	Waukesha.
Pirner, John, Jr.	New London, R. 3	Waukesha.
Blakely, Albert J.	Neenah	Winnebago.
Bussey, W. P.	Omro	Winnebago.
Harrison, Geo.	Omro	Winnebago.
Kronholm, Victor E.	Grand Rapids.	Wood.
Potter, Guy	Grand Rapids	**Wood.**

Toole's North Star corn (Wisconsin No. 11).

Name of grower.	Address.	County.
Hopkins, S. Y.	Basco	Dane.
Hackett Charles	Baraboo	Sauk.
Toole, W. A.	Baraboo	Sauk.
Carey, Henry	Pine River	Waushara.

Clark's yellow dent corn (Wisconsin No. 1).

Name of grower.	Address.	County.
Ellickson, A. C.	Arlington	Columbia
Jung, A. E.	Randolph	Columbia
Finsnes, Andrew	Stoughton	Dane.
Thorstad, N. H.	Deerfield	Dane.
Wernick, William H.	DeForest	Dane.
Irving, J. W.	Randolph	Dodge.
Howitt, Chas. H.	Randolph	Dodge.
Vosberg, H. L.	Louisberg, R. 2	Grant.
Biglow, L. F.	Brooklyn	Green.
Smiley, Jas. B.	Albany	Green.
McNown, J. H.	Mauston	Juneau.
Post, Harry L.	Sextonville	Richland.
Benedict, E. L.	Beloit	Rock.
Dunbar, Harry D.	Elkhorn	Walworth.
Marck, L. G.	Honey Creek	Walworth.
Schwartz, Walter W.	Troy Center	Walworth.
Longley, H. N.	Dousman	Waukesha.

Golden Glow corn (Wisconsin No. 12).

Name of grower.	Address.	County.
Hanson, E. A.....	Pardeeville	Columbia.
Boss, S. J. Jr.....	Oshkosh, R 7.....	Winnebago.
Meyer, A. J.....	Howell, R. 7.....	Michigan.

Soy beans.

Name of grower.	Address.	County.
Nies, Peter	Greenleaf	Brown.
Christoph, T. F.....	Chilton	Calumet.
Einfeldt, Albert	**Greenwood .....**	Clark.
Hansen, E. A.....	Pardeeville	**Columbia.**
Chynoweth, H. E.....	Madison, R. F. D.....	**Dane.**
Gillette, Rufus	**Verona .....**	**Dane.**
Kaltenberg, Anthony ..	**Waunakee .....**	Dane.
Norsman, Jerome O...	**Madison, R. F. D.....**	Dane.
Peck, H. M.....	Marshall	Dane.
Wernick, Wm. H.....	DeForest	Dane.
Beule, Elmore A.....	Fox Lake	Dodge.
Bohl, Joseph N.....	Beaver Dam	Dodge.
Krueger Henry E.....	Beaver Dam, R. 1....	Dodge.
Mahoney, David	Juneau	Dodge.
Boucsein, Gust	**Detroit Harbor .....**	Door.
Erickson, Ole C.....	Detroit Harbor	Door.
Sullivan, J. J.....	Forestville	Door.
Winter, L. H.....	Eau Claire, R. 4.....	Eau Claire.
Donaldson, H. A.....	Eau Claire, R. 3.....	Eau Claire.
Brunson, Levi E.....	Rosendale	Fond du Lac.
Gibbard P. J.....	Ripon	Fond du Lac.
Hinz, A. F.....	**Ripon .....**	Fond du Lac.
Meekin, H. W.....	**Fond du Lac .....**	Fond du Lac.
Whittaker, Horace	Fond du Lac	Fond du Lac.
Grimstad, A. C.....	Barneveld	Iowa.
Cameron, Duncan A...	La Crosse	LaCrosse.
Mielder, B. W.....	Midway	LaCrosse.
Andrews, Arthur	So. Wayne	LaFayette.
Leverenz, Roy B.....	Tomahawk	Lincoln.
Heidemann, Otto C. ...	Kiel, R. 2.....	Manitowoc.
Sullivan, James A....	**Grimms .....**	Manitowoc.
Houslet, Neal	Packwaukee	Marquette.
Whitehead, Henry W..	Leon	Monroe.
Mueller, Edw. O.....	Appleton, R. 1	Outagamie.
Siegert, A.....	Appleton	Outagamie.
Hicks Earl S.....	Pepin	Pepin.
Tretsven, Oscar	Milltown	Polk.

Soy beans.

Name of grower.	Address.	County.
Rasmussen, Gordon S.	Franksville, R. 9.....	Racine.
Ghastin, Wm. J.....	Twin Bluffs	Richland.
Post, Harry L.....	Sextonville	Richland.
Acker, James	Milton	Rock.
Hoague, Charlie	Janesville, R. 7.....	Rock.
Gross, Waldo E.....	Merrimac	Sauk.
Ochsner, Arthur C....	Plain	Sauk.
Frauenheim, O. R.....	Random Lake.....	Sheboygan.
Garside, Harry R.....	Cedar Grove	Sheboygan.
Herdich, S. F.....	Adell, R. 19.....	Sheboygan.
Sharpe, Charles E.....	Waldo	Sheboygan.
Engleman, J. P.....	Galesville	Trempealeau.
Anderson, Alvin M....	Whitewater	Walworth.
Peterson, E. C.....	Whitewater	Walworth.
West, Mark H.....	Elkhorn, R. 1.....	Walworth.
Bast, Paul J.....	Rockfield	Washington.
Spaulding, C. F.....	Oconomowoc	Waukesha.
Swoboda, F. G.....	Dousman	Waukesha.
Bille, J.....	Waupaca, R. 1.....	Waupaca.
Stratton, J. W.....	Waupaca	Waupaca.
Anderson, Thos. E....	Wild Rose	Waushara.
Phillips, Jesse.....	Elizabeth	Illinois.
Thompson, Thor. Jr....	Wadena	Iowa.

Alfalfa seed.

Name of grower.	Address.	County.
Becker, P. V.....	Plymouth	Sheboygan.
Meurer, Paul.....	Genoa Junction	Walworth.

Clover seed.

Name of grower.	Address.	County.
Roeckel, Jos. P.	Lark	Brown.
Joos, Frank B.	Fountain City	Buffalo.
Christoph, T. F.	Chilton	Calumet.
Peterson, Henry N.	New Holstein	Calumet.
Zerbel, H.	Humbird	Clark.
Hopkins, S. Y.	Basco	Dane.
Krueger, Henry E.	Beaver Dam, R. 1	Dodge.
Konz, John Sr.	Fairchild	Eau Claire.
Winter, L. H.	Eau Claire, R. 4	Eau Claire.
Wright, Geo. T.	Eau Claire, Box 195	Eau Claire.
Wright, Wray C.	Eau Claire, Box 195	Eau Claire.
Briggs, J. W.	Peebles	Fond du Lac.
Jacky, Harvey L.	Malone, R. 39	Fond du Lac.
Meekin, H. W.	Fond du Lac	Fond du Lac.
Miritz, O. F.	Fond du Lac	Fond du Lac.
Dettinger, Wm. F.	Hixton	Jackson.
Merrill, W. M.	Taylor	Jackson.
McNown, J. H.	Mauston	Juneau.
Harr, Ernest B.	Bangor	La Crosse.
Klann, Adolph	Hayton	Manitowoc.
Thieleke, Edwin A.	Cleveland	Manitowoc.
Falarsh, Frank.	Peshtigo	Marinette.
Dennison, Nicholas.	No. Milwaukee, R. 10	Milwaukee.
Pierner, J. W.	Thiensville	Ozaukee.
Newhouse, K. K.	Clinton	Rock.
Schoephorster, Henry J.	Prairie du Sac	Sauk.
Hildemann, E. S.	Belle Plaine	Shawano.
Fischer, Louis H.	Haven, R. 6	Sheboygan.
Frauenheim, O. R.	Random Lake	Sheboygan.
Herdrich, S. F.	Adell, R. 19	Sheboygan.
Illian, William L.	Adell, R 19	Sheboygan.
Lewis, E. H.	Whitewater	Walworth.
Meurer, Paul Jr.	Genoa Junction	Walworth.
Bast, Paul J.	Rockford	Washington.
Puls, John.	Hartford, R. 4	Washington.
Kneipp, William.	Weyauwega	Waupaca.
Carey, Henry.	Pine River	Waushara.
Heuer, Edw. F.	Wautoma	Waushara.
Vandercook, R. I.	Linden, R. 2	Michigan.

State Fair Exhibit, 1907.

ANNUAL REPORT

OF THE

Wisconsin State Horticultural Society

FOR THE YEAR 1908

VOLUME XXXVIII

F. CRANEFIELD, Secretary
MADISON, WIS.

MADISON, WIS.
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1908

LETTER OF TRANSMITTAL.

MADISON, WIS., March 1, 1908.

To His Excellency, JAMES O. DAVIDSON,
Governor of Wisconsin,

DEAR SIR:—I have the honor to transmit to you herewith the Thirty-eighth Annual Report of the Wisconsin State Horticultural Society.

Respectfully,

FREDERIC CRANEFIELD,
Secretary.

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CONSTITUTION AND BY-LAWS.

CONSTITUTION.

Article I. This society shall be known as the Wisconsin State Horticultural Society.

Article II. Its object shall be the advancement of the art and science of horticulture throughout the state.

Article III. Its members shall consist of annual members paying an annual fee of fifty cents excepting that paid members of local societies may become members on payment of an annual fee of twenty-five cents, of life members paying a fee of five dollars. Wives of such members shall be entitled to the privileges of full membership; of honorary annual members who may by vote be invited to participate in the proceedings of the society and honorary life members who shall be distinguished for merit in horticulture and kindred sciences or who shall confer any particular benefit upon the society.

Article IV. Its officers shall consist of a President, Vice-President, Secretary, Treasurer, and an Executive Committee, consisting of the foregoing officers and additional members, one from each congressional district of the state, five of whom shall constitute a quorum at any of its meetings. All above officers, except Secretary, shall be elected by ballot, and shall hold office for one year thereafter, and until their successors are elected. The Secretary shall be appointed by the Executive Committee at the annual meeting, after the election of officers, and shall hold office for one year thereafter, or until his successor is appointed.

Article V. The members of the Executive Committee from the several congressional districts shall be chosen by the delegates of their respective county or local societies present at the annual meeting of this society, or in case of the absence of delegates from such societies or in case of failure to elect, such members shall be chosen from among the members of this society present from such districts. But if any district is not represented the vacancy shall be filled by vote of the members of this society present at the annual meeting.

Article VI. The term "County and local horticultural societies" shall include any organization that shall have for its sole object the advancement of the interests of its members in the growing or sale of horticultural crops; provided, that such society acts by authority of a regularly adopted constitution and makes an annual report to the Secretary of the state society.

Article VII. The society shall hold its annual meeting for the election of officers, exhibition of fruits and discussions, in Madison, and such other meetings and at such time and place as the Executive Committee may direct.

Article VIII. The President, Treasurer, and Secretary shall constitute a Board of Managers which may conduct any business deemed necessary for the society in the absence of the Executive Committee. All bills against the society must be audited by the Board of Managers before being paid.

Article IX. This constitution, with the accompanying by-laws, may be amended at any regular meeting by a two-thirds vote of the members present.

BY-LAWS.

I. The President shall preside at meetings, and, with the advice of the Secretary, call all meetings of the society, and have general supervision of the affairs of the society, and shall deliver an annual address upon some subject connected with horticulture.

II. The Vice-President shall act in the absence or disability of the President, and perform the duties of the chief officer.

III. The Secretary shall attend to all the correspondence, shall record the proceedings of the society, preserve all papers belonging to the same, and superintend the publication of its reports. He shall also present a detailed report of the affairs of the society at its annual meeting. He shall also endeavor to secure reports from the various committees, and from local societies of the condition and progress of horticulture in the various districts of the state, and report the same to the society. He shall also be Superintendent of all Trial Orchards. It shall be the duty of the Secretary to make a report to the governor of the state of the transactions of the society, according to the provisions of the statutes for state reports.

IV. The Superintendent of Trial Orchards shall supervise the planting and cultivation of the trial orchards and trial stations and shall exercise general control of the same, subject to the directions of the Trial Orchard Committee.

V. The Treasurer shall keep an account of all moneys belonging to the society and disburse the same on the written order of the President, countersigned by the Secretary, and shall make an annual report of the receipts and disbursements, and furnish the Secretary with a copy of the same on or before the first day of the annual meeting. The Treasurer elect shall, before entering upon the discharge of the duties of his office, give good and sufficient bonds for the faithful performance of his duties subject to the approval of the Executive Committee.

VI. The Executive Committee may manage all the affairs of the society and fill all vacancies in the board of officers; meetings of the committee may be called by the President, the Secretary or by the Secretary on written request of five members.

VII. Regular meetings of the Board of Managers shall be held bimonthly to audit accounts and transact other business; special meetings may be called by any member of the Board.

VIII. The standing committees of this society shall be as follows:

1st. Committee on Finance, consisting of three members.

2d. Committee on Nomenclature and New Fruits, consisting of three members.

3d. Committee on Trial Orchards and Trial Stations, consisting of three members, and such other committees as may be determined from time to time to be necessary. Said committees to be appointed annually by the President.

IX. It shall be the duty of the Finance Committee to settle with the Treasurer and to examine and report upon all bills or claims against the society which may have been presented and referred to them.

X. The Trial Orchard Committee shall have general control of the locating, planting and care of all trial orchards or trial stations, and shall visit collectively each orchard or station once each year or oftener if deemed necessary. Meetings of the committee may be called at any time by the President of the society or by the Superintendent of Trial Orchards.

LIST OF FRUITS RECOMMENDED FOR CULTURE IN WISCONSIN.

The behavior of varieties of fruits is influenced very largely by environment. The conditions of soil, exposure and latitude over such an area as the state of Wisconsin vary greatly and no list can be given that will prove satisfactory in all localities. The following provisional lists were prepared by the Trial Orchard Committee. Hardiness of Plant and fruit bud has been the leading thought in the selection of varieties.

APPLES (General List).

Alexander, Astrachan (Red), Autumn Strawberry, Dudley, Fall Orange, Fameuse (Snow), Golden Russett, Hibernal, Lowland Raspberry, Longfield, Lubsk Queen, McIntosh, Malinda, McMahan, Newell, Northwestern Greening, Oldenburg (Duchess), Patten Greening, Perry Russett, Plumb Cider, Scott, Tetofski, Talman (Sweet), Utter, Wealthy, Westfield (Seek-no-Further), Windsor, Wolf River, Yellow Transparent.

APPLES (Lake Shore List).

In addition to the above many other varieties including the following may be successfully grown in the extreme southern part of the state and in the counties bordering on Lake Michigan. **Baldwin, Eureka, Fallawater, Gano, King, Northern Spy, Pewaukee, Willow Twig, York Imperial, Bellflower.**

APPLES (Commercial Orchard List).

It is generally conceded that a commercial orchard should consist of but few varieties; the following are suggested: **Dudley. Fameuse, Longfield, McMahan, McIntosh, Northwestern Greening, Oldenburg, Scott, Utter, Wealthy, Yellow Transparent.**

APPLES (Five Varieties for Farm Orchard).

Northwestern Greening, Oldenburg (Duchess), Talman (Sweet), Wealthy, Yellow Transparent.

APPLES (For Trial)

These are all promising varieties but have not been extensively grown in any part of the state. **Gem City, Hanko, Lily, Wendorff, Zettle Bellflower.**

CRABS.

Brier Sweet, Hyslop, Lyman, Martha, Sweet Russett, Transcendent, Whitney.

PLUMS.

Of the classes commonly cultivated, viz.: **European, Japanese** and **Native** or **American,** the last named is the most reliable.

NATIVE PLUMS.

De Soto, Forest Garden, Hammer, Hawkeye, Ocheeda, Quaker, Rockford, Surprise, Wyant.

EUROPEAN PLUMS.

(Not recommended except along Lake Shore). **Lombard, Green Gage, Moore's Arctic.**

JAPANESE PLUMS.

(Not recommended except along Lake Shore). **Abundance, Burbank.**

CHERRIES.

Early Richmond, Montmorency.

GRAPES.

Brighton, Campbell's Early, Concord, Delaware, Diamond, Green Mountain, Moore's Early, Niagara, Worden.

BLACKBERRIES.

Briton (Ancient), Eldorado, Snyder.

STRAWBERRIES.

Varieties starred have imperfect flowers and must not be planted alone.

Bederwood, *Crescent, Clyde, Dunlap, Enhance, Gandy, Glen Mary, *Haverland, Lovett, *Sample, Splendid, *Warfield.

TWO VARIETIES STRAWBERRIES FOR FARM GARDEN.

Dunlap, *Warfield.

RASPBERRIES.

Black: **Conrath, Cumberland, Gregg, Older.**
Red: **Cuthbert, Loudon, Marlboro.**
Purple: **Columbian.**

CURRANTS.

Red: **Red Cross, Red Dutch, Long Bunch Holland, Victoria.**
White: **White Grape.**
Black: **Lee's Prolific, Naples.**

GOOSEBERRIES.

Downing.

PEARS.

On account of the prevalence of blight and winter killing, pears are not generally recommended for Wisconsin. Good crops are occasionally produced under favorable conditions, especially in the southeastern part of the state. The following list includes both early and late varieties. List prepared by W. J. Moyle.

Bartlett, Clapp Favorite, Early Bergamont, Flemish Beauty, Idaho, Kieffer, Lawson, Seckel, Sheldon, Vermont Beauty.

TREES AND SHRUBS RECOMMENDED.

EVERGREENS.

For screens and windbreaks—Norway Spruce, White Spruce, White Pine.

For hedges and screens for shearing—Norway Spruce, American Arbor Vitae, Red Cedar.

For lawns—Norway Spruce for backgrounds. For groups—American Arbor Vitae, Red Cedar, White Spruce, Colorado Blue Spruce.

For small lawns—Arbor Vitae, Savin Juniper, Mugho Pine.

DECIDUOUS TREES.

The more derisable ones are starred, and a further selection of five is indicated by double stars.

**American Elm, Box Elder, Black Cherry, Carolina Poplar, **Green Ash, *Hackberry, Honey Locust, Larch, **Linden, **Norway Maple, *Scarlet Maple, **Silver Maple, *Sugar Maple, Scarlet Oak, *White Oak, White Ash.

DECIDUOUS ORNAMENTAL TREES.

This class includes smaller deciduous trees of more value for ornament than for shade or defense.

Crab (native), also Bechtel's double flowering crab, Cut-leaved Weeping Birch, Tartarian Maple, Ginnala Maple, Kentucky Coffee Tree, Mountain Ash, Weeping Willow, Russian Mulberry.

LIST OF SHRUBS RECOMMENDED.*

Scientific Name.	Common Name.
Berberis vulgaris	Common Barberry
Barberis vulgaris var. atropurpurea	Purple-leaved Barberry
Berberis Thunbergii.	Thunberg's Barberry

* From Bulletin 108, Wisconsin Experiment Station, by F. Cranefield.

Corylus maxima var. purpurea.....Purple Filbert
Diervilla florida .....Weigela (rose)
Diervilla candida .....Weigela (white)
Diervilla hybrida .....Weigla (Eva Rathke)
Diervilla hybrida var. Desboisii.....Desbois Weigela
Eleagnus argenta. .....Silver Berry
Euonymus Europaeus. .....Strawberry Tree
Hibiscus Syriacus. .....Althea
Hippophae rhamnoides. .....Sea Buckthorn
Hydrangea paniculata gr. .....Garden Hydranga
Lonicera Ruprechtiana .....Ruprecht's Honeysuckle
Lonicera Tartarica. .....Tartarian Honeysuckle
Morus Alba var. .....Tea's Weeping Mulberry
Philadelphus coronarius .....Mock Orange
Philadelphus coranarius var. aurea.....Golden Mock Orange
Philadelphus inodorus .....Mock Orange, large fl.
Pontentilla fruticosa. .....Shrubby Clinque Foil
Prunus nana .....Russian Almond
Rhodotypos kerrioides .....Rhodotypos
Rhus Cotinus. .....Smoke Bush
Ribes aureum. .....Missouri Flowering Currant
Robinia hispida .....Rose Acacia
Rosa rugosa. .....Japanese Rose
Sambucus nigra var. aurea.....Golden Elder
Shepherdia argentea .....Buffalo Berry
Spiraea Bumalda. .....Bumalda Spiraea
Spiraea Bumalda var. .....Anthony Waterer Spiraea
Spiraea Billardii .....Billard's Spiraea
Spiraea Douglassi .....Douglas' Spiraea
Spiraea Japonica. .....Japanese Spiraea
Spiraea salicifolia. .....Meadow Sweet Spiraea
Spiraea Van Houtte.....Van Houten's Spiraea
Syringa Persica.....Persian Lilac
Syringa villosa .....Chinese Lilac
Syringa vulgaris. .....Common Lilac
Tamarix Pallassii Desv. (Tamarix Amurense Hort.)....Amur. Tamarix
Viburnum Opulus vr. sterile.....Snowball

ROSES.

Hardy garden—Harrison Yellow, Persian Yellow, Madame Plantier.

Twelve varieties hybrid perpetual—Paul Neyron, Mrs. J. H. Laing, Gen. Jacqueminot, Dinsmore, Marshall P. Wilder, Coquettes des

Blanches, Earl of Dufferin, Jules de Margottin, Vick's Caprice, Magna Charta, Prince Camille de Rohan, General Washington.

Moss roses—Perpetual White, Salet, Paul Fontine, Henry Martin.

Climbers—Prairie Queen, Russel's Cottage, Seven Sisters, Gem of the Prairies, Crimson Rambler.

Five hybrid perpetual roses for the garden: Gen. Jacqueminot, Magna Charta, Margaret Dixon, Mrs. John Laing, Paul Neyron.

COMPARATIVE HEIGHT AT MATURITY OF DIFFERENT SHRUBS.

The height at maturity of the different species must be considered when planting in groups or borders. This will depend so much upon their environment that it is difficult to give the height in feet that any species may be expected to attain. When different kinds are planted under like conditions it may be assumed that relative heights will be maintained. The following may serve as a partial guide in planting:

Tall—10 to 15 Feet.

Barberry (Common)
Lilac, Common
Barberry (Purple-leaved)
Lilac, Japanese
Golden Elder
Lilac Jossika's
Honeysuckle, Fly
Mock Orange
Honeysuckle, Slender
Sea Buckthorn
Honeysuckle, Tartarian
Siberian pea tree (tall)
Honeysuckle, Tartarian white

Medium—6 to 10 Feet.

Crandall Currant
Silver Berry
Honeysuckle, Blue
Strawberry Tree
Japanese Rose
Spiraea, Billiards
Lilac, Chinese
Spiraea, Douglas

Purple Filbert
Spiraea, Three-lobed
Rose Acacia
Spiraea, Van Houten's
Russian Almond
Weeping Mulberry
Siberian Pea tree (dwarf)
Wiegelas

Dwarf—2 to 6 Feet.

Althea
Spiraea, Anthony Waterer
Barberry, Thunberg's
Spiraea, Ash-leaved (Sorbaria)
Cinque Foil
Spiraea, Bumalda
Honeysuckle, Albert's
Spiraea, Japanese
Hydrangea
Spiraea, Meadow Sweet
Rhodotypos
Spiraea, Plum-leaved

A LIST OF NATIVE SHRUBS DESIRABLE FOR PLANTING ON HOME GROUNDS.

Scientific Name.	Common Name.
Arctostaphylos Uva-ursi	Bearberry
Ceanothus Americanus	New Jersey Tea
Cephalanthus occidentalis	Button Bush
Cimaphila umbellata	Prince's Pine
Comptonia aspleniflora	Round-leaved Dogwood
Cornus stolinifera	Red Osier Dogwood
Dirca palustris	Leatherwood (Wickopy)
Epigaea repens	Trailing Arbutus
Euonymus atropurpureus	Wahoo
Hypericum pyramidatum	St. John's Wort
Ilex verticillata	Winterberry (Holly)
Juniperus procumbens	Trailing Juniper
Myrica Gale	Sweet Gale
Physocarpos opulifolia	Ninebark
Rhamnus catharticus	Buckthorn
Rhus Typhina	Staghorn Sumac

Rhus Glabra .....Smooth Sumac
Rhus copallina .....Dwarf Sumac
Ribes rubrum .....Wild Rose Currant
Ribes floridum. .....Wild Black Currant
Rosa lucida .....Wild Rose (tall)
Rosa blanda .....Wild Rose (dwarf)
Rubus odoratus .....Purple-flowered Raspberry
Rubus Nutkanus. .....White-flowered Raspberry
Sambucus Canadensis .....Common Elder
Sambucus pubens .....Scarlet Elder
Shepherdia Canadensis. .....Shepherdia
Symphoricarpus racemosus. .....Snowberry
Symphoricarpus vulgaris .....Coral Berry
Taxus baccata. .....Ground Hemlock
Viburnum lentago.....Sheepberry
Viburnum dentatum .....Black Haw
Viburnum acerifolium. .....
Viburnum opulus .....Bush Cranberry
Zantoxylum Americanum. .....Prickly Ash

SIX SHRUBS FOR HOME GROUNDS.

The following are all reliably hardy in any part of the State.

Common Lilac, Tartarian Honeysuckle, Rosa Rugosa, Mock Orange or Syringa, Van Houten's Spiraea, Common Barberry.

THREE PERENNIAL VINES.

Ampelopsis or American Ivy, (native in Southern Wisconsin). Wild Grape, Trumpet Honeysuckle.

BLACK LIST.

A LIST OF SHRUBS ALL OF WHICH HAVE BEEN TESTED ON THE GROUNDS OF THE EXPERIMENT STATION AT MADISON AND FOUND UNSATISFACTORY.

Scientific Name.	Common Name.
Azalea arborescens.	Rhododendron
Azalea viscosa.	Rhododendron
Azalea nudiflora.	Azalea
Azalea mollis	Azalea
Calycanthus floridus.	Sweet-scented shrub
Caryopteris Mastacanthus	Blue Spiraea
Chionanthus Virginica	White Fringe
Clethra alnifolia.	Sweet Pepperbush
Colutea arborescens	Bladder Senna
Cornus florida	Flowering Dogwood
Cydonia Japonica	Japanese Quince
Daphne Cneorum.	Daphne
Daphne Mezereum	Daphne
Deutzia gracilis.	Slender Deutzia
Eleagnus longipes	Goumi
Exochorda grandiflora.	Pearl Bush
Forsythia suspensa.	Golden Bell
Halesia tetraptera	Snowdrop tree
Itea Virginica	Virginia Willow
Kerria Japonica	Kerria
Ligustrum vulgare.	Common privet
Paulownia imperialis.	Paulownia
Prunus cerasifera var. (Prunus pissardi Hort)	Purple-leaved Plum
Prunus Japonica	Flowering Almond
Prunus triloba.	Flowering plum (double)
Spiraea Arguta	Arguta Spiraea
Spiraea Thunbergii	Thunberg's Spiraea

The plants of certain of the above named varieties made a good growth each year but have not blossomed unless given thorough winter

protection. In this class are Bladder Senna, Flowering Almond, Flowering Plum and Golden Bell.

The Japanese Quince is hardy of bush but has not borne flowers except when given winter protection. The Goumi will only bear fruit when protected in winter. The double-flowered Almond will blossom freely if given thorough winter protection, otherwise it will kill back severely. The double-flowered Plum grows well and after a mild winter will bear flowers in advance of the leaves; unreliable, however, four years out of five if unprotected.

The others of this list have either died outright or else barely survived.

OFFICERS AND COMMITTEES FOR 1908.

President, R. J. Coe.....Ft. Atkinson
Vice-President, D. E. Bingham.....Sturgeon Bay
Treasurer, L. G. Kellogg.....Ripon
Secretary, F. Cranefield.....Madison

EXECUTIVE COMM TTEE.

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D. E. Bingham.....Ex-Officio
L. G. Kellogg.....Ex-Officio
F. Cranefield.....Ex-Officio
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2nd Dist., Prof. E. P. Sandsten.....Madison
3rd Dist., Wm. Toole.....Baraboo
4th Dist., C. L. Meller.....Milwaukee
5th Dist., H. C. Melcher.....Oconomowoc
6th Dist., L. A. Carpenter.....Fond du Lac
7th Dist., A. J. Philips.....West Salem
8th Dis., M. E. Henry.....Oshkosh
9th Dist., W. S. Hager.....Depere
10th Dist., Irving Smith.....Ashland
11th Dist., C. L. Richardson.....Chippewa Falls

FINANCE COMMITTEE.

T. E. Loope, Chairman.....Eureka
Wm. Longland.....Lake Geneva
C. L. Pearson.....Baraboo

COMMITTEE ON TRIAL ORCHARDS.

L. G. Kellogg, term expires.....Feb., 1911
D. E. Bingham, term expires.....Feb., 1910
R. J. Coe., term expires.....Feb., 1909

COMMITTEE ON CO-OPERATIVE FRUIT MARKETING.

W. H. Hanchett, D. E. Bingham, C. L. Pearson.

LOCATION OF TRIAL ORCHARDS.

Wausau, Marathon county, 10 acres.....Established 1897
Medford, Taylor county, 3 acres.....Established 1903
Poplar, Douglas county, 10 acres.....Established 1904
Maple, Douglas county, 3 acres.....Established 1906
Barron, Barron county, 5 acres.....Established 1906
Manitowoc, Manitowoc county, 5 acres.....Established 1907
Gays Mills, Crawford county, 5 acres.....Established 1907
Sturgeon Bay, Door county, 5 acres.....Established 1908
Sparta, Monroe county, 1 acre (Grape Station).....Established 1908

MEMBERS OF THE WISCONSIN STATE HORTICULTURAL SOCIETY.

LIFE MEMBERS.

	County
Allis, Frank W	Dane
Ames, W. L.	Dane
Ayer, Ed. E	Walworth
Babcock, O. W	Winnebago
Barnes, A. D.	Waupaca
Barnett Bros.	Chicago, Ill.
Brown, F. G.	Dane
Buckstaff, D. C.	Winnebago
Buehler, J. G.	Richland
Bussey, W. P.	Winnebago
Carpenter, L. A.	Fond du Lac
Carver, N. E.	Bayfield
Cashman, Thos. E.	Minnesota
Chandler, S. S., Jr.	Waupaca
Chapple, F. H.	Dane
Coe, R. J.	Jefferson
Cole, W. B.	Kenosha
Converse, D. C.	Jefferson
Dunn Co. School of Agr. & Domestic Economy	Menomonie
Eaton, B. A.	Milwaukee
Edwards, F. C.	Jefferson
Fancher, W. E.	Racine
Fieldhouse, Wm.	Iowa
Fiebing, J. H.	Milwaukee
Foley, M. F.	Sauk
France, N. E.	Grant
Freeman, G. A.	Monroe
Freeman, Roy F.	Racine
Guilford, W. S.	Illinois
Hager, W. S.	Brown
Hanchett, W. H.	Monroe
Harris, N. W.	Walworth

Harland, F. W. ..... Milwaukee
Harden, F. A. ..... Waupaca
Herbst, J. L. ..... Monroe
Hudnall, George B. ..... Douglas
Hutchinson, C. L. ..... Walworth
Johnson, Chas. ..... Waupaca
Johnson, Franklin ..... Sauk
Jones, John D. ..... Grant
Jones, G. D. ..... Marathon
Joys, A. M. ..... Milwaukee
Kierstead, E. H. ..... Dane
Kellogg, M. S. ..... Rock
Kellogg, Geo. J. ..... Jefferson
Kellogg, L. G. ..... Green Lake
Knight, Wm. ..... Bayfield
Koehler, John ..... Milwaukee
Kremers, Prof. E. ..... Dane
Kreutzer, A. L. ..... Marathon
Krienetz, Alfred J. ..... Milwaukee
La Follette, Hon. Robt. M. ..... Dane
Lathrop, Rev. Stanley E. ..... Ashland
Loope, Dr. T. E. ..... Winnebago
Loop, A. I. ..... Pennsylvania
Malde, O. G. ..... Wood
Manitowoc Seed Co. ..... Manitowoc
Marshall, S. H. ..... Albemarle Co., Va.
McGregor, E. L. ..... Outagamie
Naffz, Henry E. ..... Sauk
Oleson, Janes P. ..... Green Lake
Orr, E. D. ..... Grant
Palmer, L. H. ..... Sauk
Peck, Chas. J. ..... Sheboygan
Plumb, W. H. ..... Dane
Pollworth, C. C. ..... Milwaukee
Raymer, Geo. ..... Dane
Rentschler, F. ..... Dane
Richardson, E. A. ..... Monroe
Riordan, D. E. ..... Ashland
Rounds, Wm. ..... Sauk
Rosenow, H. E. ..... Waukesha
Ruste, G. O. ..... Dane
Ryerson, M. A. ..... Walworth
Salter, Walter N. ..... Taylor
Saxe, Arthur ..... **Walworth**

Schuette, Aug. ..... Manitowoc
Simon, H. ..... Sauk
Simonson, Arthur ..... Racine
Seubert, John ..... Minnesota
Smith, Irving ..... Ashland
Smith, Geo. B. ..... Brown
Smith, Silas S. ..... Forest
Steele, W. H. ..... Waukesha
Taylor, Will L. ..... Grant
Tifft, Geo. L. ..... Milwaukee
Tilison, Mrs. Ida E. ..... La Crosse
Tittemore, J. N. ..... Winnebago
Toole, Wm. ..... Sauk
Toole, W. A. ..... Sauk
Treleven, Jos. D. ..... Winnebago
Underwood, J. M. ..... Minnesota
Underwood, Roy ..... Minnesota
Vaughn, B. ..... Wood
Van Dyke, Geo. D. ..... Milwaukee
Webb, W. H. ..... Douglas
Williams, Norman G. ..... Outagamie
Williams, Daniel ..... Waukesha
Wright, Arthur ..... Milwaukee

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M. E. Hinkley ..... Mt. Vernon, Iowa
C. G. Patten ..... Charles City, Iowa
Jonathan Periam ..... Chicago, Ill.
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A. J. Philips ..... West Salem, Wis.
Prof. Wm. Trelease ..... St. Louis, Mo.

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W. D. Boynton ..... Shiocton, Wis.
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Prof. L. R. Taft.....Agricultural College, Mich.
Wm. A. Taylor.....Washington, D. C.
J. R. Kirk.....Mason City, Iowa

ANNUAL MEMBERS.

Adamson, Mrs. C. F.....Dane
Ahlers, Walter.....Ozaukee
Alexson, A.....Monroe
Allen, James.....Marathon
Anderson, J. P.....Ashland
Andeson, J. S.....Manitowoc
Anderson, Fred.....Racine
Askett, W. H.....Monroe
Aznoe, John.....Door
Baensch, Emil.....Manitowoc
Babcock, F. E.....Monroe
Babcock, Dr. S. M.....Dane
Baker, H. J.....Fond du Lac
Baldwin, Herbert.....Oconto
Barringer, W. E.....Sauk
Barden, W. F.....Milwaukee
Bardenwerper, C. H.....Milwaukee
Barnes, Geo. F.....Milwaukee
Bartlett, C. M.....Barron
Bathrick, D. D.....Illinois
Beach, Prof. S. A.....Iowa
Bedell, E. S.....Manitowoc
Bennett, A. E.....Wood
Bennett, A. C.....Wood
Bennett, W. F.....Illinois
Benjamin, R. F.....Waukesha
Beerend, Dr. C.....Milwaukee
Bentley & Kelley.....Sauk
Bethke, Ed.....Milwaukee
Bigelow, Ray.....Ashland
Bingham, D. E.....Door
Bisbee, John.....Minnesota
Bjaadall, K. O.....Dane
Blackman, Henry B.....Richland

Black, Harry ..... Jefferson
Bodenstein, F. ..... Dane
Bonns, W. W. ..... New York
Book, J. A. ..... Manitowoc
Bowman, Dr. F. F. ..... Dane
Boyles, C. L. ..... Walworth
Bradt, H. H. G. ..... Winnebago
Brandenburg, O. D. ..... Dane
Brainard, C. P. ..... Grant
Bresnehan, P. G. ..... Waushara
Brewer, F. E. ..... Sauk
Bridge, F. A. ..... Dane
Bridge, H. A. ..... Outagamie
Briggs, Newton ..... Dane
Briggs, E. G. ..... Crawford
Brigham, Chas. I. ..... Dane
Brinker, Chas. ..... Missouri
Brown, Preston W. ..... Dane
Brown, C. L. ..... Milwaukee
Brown, S. L. ..... Crawford
Brown, A. D. ..... Douglas
Brown, A. D. ..... Sauk
Brown, F. M. ..... Dane
Bumbalek, John I. ..... Milwaukee
Buntrack, Theo. H. ..... Waupaca
Burdick, C. J. ..... Langlade
Burroughs, Geo. ..... Dane
Burton, Warren ..... Walworth
Burgess, Ira R. ..... Kenosha
Button, A. A. ..... Milwaukee
Button, Geo. ..... Waupaca
Cantwell, F. W. ..... Dane
Camp, Elgin ..... Walworth
Carey, C. H. ..... Michigan
Carey, J. E. L. ..... Waushara
Carley, S. A. ..... Green Lake
Carpenter, Mary ..... Dane
Children, A. G. ..... Milwaukee
Cheek, A. P. ..... Sauk
Christiansen, Prof. F. ..... Manitowoc
Christiansen, H. E. ..... Polk
Christiansen, A. H. ..... Winnebago
Christiansen, H. C. ..... Winnebago
Church, Geo. S. ..... Winnebago

Clark, M. E. ..... Dane
Cleermans, Aug. ..... Brown
Cochrane, Mrs. J. W. ..... Dane
Cole, Sheldon ..... Monroe
Cole, E. V. ..... Oconto
Cole, H. E. ..... Sauk
Coldwell, John ..... Dane
Columbia Co. Nursery Co. ..... Columbia
Conover, F. K. ..... Dane
Corell, C. A. ..... Marinette
Cooke, W. D. ..... Brown
Cooke, Carle H. ..... Trempealeau
Cooley, C. F. ..... Dane
Cooper, H. O. ..... Marquette
Crawford, J. ..... Oconto
Crawford, M. ..... Outagamie
Crowley, John ..... Monroe
Curtis, Geo., Jr. ..... Dane
Currie, James ..... Milwaukee
Darbyshire, Abe ..... Iowa
Daub, C. H. ..... Eau Claire
Davis, Chas. ..... Monroe
Davis, J. C. ..... Winnebago
Davis, Ward ..... Winnebago
Delwiche, Ed. ..... Bayfield
Deuchart, Geo. ..... Brown
Dey, Scott S. ..... Columbia
Diley, J. F. ..... Winnebago
Doherty, E. G. ..... Douglas
Doty, E. P. ..... Rock
Drake, F. B. ..... Dane
Dunning, E. E. ..... Milwaukee
Edwards, A. J. ..... Jefferson
Edwards, J. T. ..... Taylor
Ehlers, Theo. ..... Jefferson
Emery, L. J. ..... Milwaukee
Engsberg, Conrad ..... Jefferson
Everett, Dr. E. ..... Dane
Evenson, Jos. T. ..... Waupaca
Ewen, John ..... Manitowoc
Fadner, Paul ..... Calumet
Falge, Mrs. Louis ..... Manitowoc
Fargo, Mrs. Enoch J. ..... Jefferson
Fenlon, E. W. ..... Milwaukee

Ferguson, T. J. ..... Milwaukee
Filkins, C. B. ..... La Crosse
Fish, J. B. ..... Monroe
Fish, L. N. ..... Monroe
Fish, Elbert J. ..... Monroe
Fisher, L. S. ..... Monroe
Fisher, A. F. ..... Sauk
Fitch, W. H. ..... Wood
Floyd, Mrs. S. G. ..... Winnebago
Fortney, O. A. ..... Crawford
Foster, J. M. ..... Eau Claire
Fouch, H. E. ..... Marquette
French, Frank ..... Monroe
Fries, J. E. ..... Waukesha
Fuller, E. M. ..... Dane
Gabriel, H. ..... La Fayette
Gaffney, Wm. ..... Crawford
Gander, G. E. ..... Crawford
Gantke, Geo. ..... Monroe
Gentle, Geo. R. ..... Rock
Gerbracht, J. H. ..... Illinois
Gilles, Peter ..... Milwaukee
Gilles, Jos. ..... Monroe
Gillies, J. H. ..... Dane
Gillies, Albert ..... Dane
Goedjen, Henry ..... Manitowoc
Goelle, F. C. ..... Manitowoc
Goldfarb, S. ..... Sauk
Gongenbach, Ernest ..... Sheboygan
Grape, John ..... Waukesha
Grant, B. H. ..... Oneida
Green, Reuben ..... Jefferson
Haefner, G. F. ..... Monroe
Haentze, E. ..... Fond du Lac
Hahn, H. J. ..... Door
Halkney, A. ..... Winnebago
Halstead, H. L. ..... Sauk
Hamilton, H. P. ..... Manitowoc
Hansen, Neil ..... Manitowoc
Hansen, Christ. ..... Manitowoc
Harmon, Harry ..... Dane
Harper, Dr. C. A. ..... Dane
Harper, C. L. ..... Dane
Harper, Miss Blanchard ..... Dane

Harris, S. L. ..... Taylor
Harris, H. H. ..... Monroe
Hartung, Louis ..... Manitowoc
Hartwig, Sam ..... Green
Hays, J. A. ..... Crawford
Hatch, A. L. ..... Door
Hatch, C. A. ..... Richland
Hatch, L. M. ..... Iowa
Heasty, Ralph ..... Monroe
Henry, M. E. ..... Winnebago
Heffner, Chas. ..... Crawford
Hemminger, P. C. ..... Jefferson
Heubner, E. A. ..... Manitowoc
Heydrick, Herman ..... Manitowoc
Hey, Chas. ..... Illinois
Higgins, A. M. ..... Walworth
Hi deman, E. S. ..... Shawano
Hi l, A. W. ..... Marathon
Hi.l, J. N. ..... Sauk
Hinrichs, Ernest ..... Sauk
Hirsch, B. ..... Bayfield
Hodge, W. A. ..... Dane
Hoeffs, Aug. ..... Shawano
Hollister, A. H. ..... Dane
Holmes, J. B. ..... Walworth
Holt, M. A. ..... Dane
Holzhuter, Walter ..... Dane
Hood Bros. ..... Sauk
Hopkins, A. W. ..... Racine
Hoppe, Julius ..... Sauk
Hopson, E. D. ..... Dane
Horton, E. W. ..... Iowa
Howard, A. E. ..... Manitowoc
Howlett, Mrs. D. D. ..... Winnebago
Howie, John ..... Dane
Howell, Horace ..... Monroe
Hoxie, Fred. W. ..... Barron
Hubbard, H. F. ..... Manitowoc
Hubbard, C. R. ..... Manitowoc
Hull, John, Jr. ..... Sauk
Hulbert, H. H. ..... Sauk
Huntley, Mrs. ..... Jefferson
Ihrig, J. J. ..... Winnebago
Ingersoll, Geo. W. ..... Lafayette

Irwin, R. A. ..... Grant
Isaacson, Chas. ..... Douglas
Isom, R. A. ..... Dane
Jackson, Mrs. J. A. ..... Dane
Jackson, C. H. ..... Waukesha
Jacklin, H. M. ..... Waushara
Jacobs, L. M. ..... Sauk
James, P. T. ..... Richland
Jeffrey, Geo. J. ..... Milwaukee
Jewett, A. J. ..... Monroe
Johns, Prof. R. B. ..... Langlade
Johnson, Alfred E. ..... Waupaca
Johnson, Hans J ..... Trempealeau
Johnson, Chas. ..... Crawford
Johnson, M. B. ..... Illinois
Jones, Geo. G. ..... Winnebago
Jones, Owen R. ..... Dodge
Jones, E. E. ..... La Crosse
Jones, Mrs. A. C. ..... Winnebago
Jordan, Mrs. E. ..... Langlade
Jordan, J. ..... Marathon
Jorgenson, Geo. ..... Waushara
Jurgensen, Nic. ..... Crawford
Kampen, H. W. ..... Columbia
Kaufmann, H. ..... Wood
Kelley, A. M. ..... Iowa
Keopcke, M. G. ..... Milwaukee
Ketchum, I. P. ..... Dane
Kidd, Z. ..... Richland
Kieffer, M. ..... Ozaukee
Kiloy, Daniel ..... Richland
Kinder, Peter ..... Crawford
Kindlin, C. W. ..... Jefferson
Kinstler, C. ..... Bayfield
Kirwan, Michael ..... Manitowoc
Klosowski, Rev. M. ..... Portage
Kneser, J. ..... Iowa
Kney, Mrs. Clara ..... Dane
Knoke, B. A. ..... Outagamie
Koschen, Gustav ..... Milwaukee
Kornely, Chas. ..... Manitowoc
Krause, John ..... Jefferson
Kruschke, J. W. ..... Juneau
Kull, Andrew ..... Walworth

Kunst, Rev. C. J. ..... Sauk
Laird, Alex ..... Outagamie
Laager, Jacob ..... Clark
Lake Geneva Gardeners and Foremans Association ..... Walworth
Agern John, Balsdon James, Barratt James, Barratt Miles;, Barlow George, Best Wm., Button Frank, Cobb C. M. (Fontana), Dale Jacob, Dickenson H. M., Elliott Chas. (Williams Bay), Fleming Frank, Illenberger Henry, Johnson Axel, Hurry Wm., Keuhne Frank, Larson Hans, Laurence W. H., Longland Wm., Long Henry, Madison Chris, Meier Albert, Millar Fred, Mitchell James, Moore Wm. (Delavan), Morefield Clarence, McDonald John, Nelson Axel, Nills Raymond, Parshall Harry, Quinn Michael, Ruepke, Albert, Sangran Ed., Sandegard Chris., Seal David, Smith A. J., Sobbe Joe, Shepard George, Short Benjamin, Tiplady John, Tolman Henry, Topolinski John, Towne Wm., Wallsteut Wm., Yekes Herman.
Lamp, Robert ..... Dane
Lanktree, W. H. ..... Ashland
Larkin, Danford ..... Dane
Larson, Martin ..... Monroe
Larson, W. E. ..... Manitowoc
Laue, A. F. ..... Milwaukee
Lasche, A. ..... Milwaukee
Lawrence, W. I. ..... Door
Lemon, R. K. ..... Iowa
Lenicheck, F. J. ..... Milwaukee
Leonard, Wm. ..... Jefferson
Lester, O. A. ..... Crawford
Lewis, F. G. ..... Crawford
Leverich, J. W. ..... Monroe
Lillesand, L. E. ..... Dane
Lincoln, A. ..... Richland
Lippold, A. ..... Richland
Loewe, Arthur P. ..... Milwaukee
Loewe, Ed. C. ..... Milwaukee
Lohberger, Albert ..... Douglas
Loope, Eva. ..... Winnebago
Louis, A. ..... Richland
Mack, S. B. ..... Green
Madden, Tim. .....
Magnusson, Peter ..... Eau Claire
Mallory, N. V. S. ..... Outagamie
Manning, T. E. ..... Kenosha
Mason, E. L. ..... Vernon

Marshal, W. S. ..... Dane
Marshall, R. D. ..... Dane
Marshall, A. C. ..... Winnebago
Marshall, J. P. ..... Columbia
Marsh, H. F. ..... Langlade
Marsh, W. H. ..... Langlade
Marken, Otis ..... Manitowoc
Marriott, E. G. ..... Sauk
Marriott, Mrs. E. G. ..... Sauk
Maxson, Dr. O. P. ..... Illinois
Meachem, Geo. ..... Shawano
Meller, C. L. ..... Milwaukee
Melcher, Henry ..... Waukesha
Melcher, W. S. ..... Washington
Melville, James W. ..... Chippewa
Meyer, A. J. ..... Racine
Meyer, C. R. ..... Trempealeau
Mills, Geneveive ..... Dane
Miller, John ..... Monroe
Milward, J. G. ..... Dane
Mische, E. T. ..... Oregon
Mitchell, Richard ..... Crawford
Moore, J. G. ..... Dane
Moore, V. V. ..... Sauk
Moore, Henry C. ..... Juneau
Montgomery, L. E. ..... Sauk
Moseley, J. E. ..... Dane
Moyle, W. A. ..... Racine
Mueller, Wm. E. ..... Dane
Muhlenkamp, Fred ..... Monroe
Mulrenin, B. ..... Monroe
Muller, Miss E. T. ..... Waukesha
McCormick, F. ..... Crawford
McGovern, W. P. ..... Ozaukee
McKay, W. G. ..... Columbia
McLay, Geo. R. ..... Rock
Naud, George R. ..... Douglas
Nehs, C. A. ..... Waukesha
Neil, D. D. ..... Crawford
Nelson, Martin ..... Rock
Nelson, J. C. ..... Brown
Nero, Wm. ..... Ozaukee
Nienaber, B. H. ..... Manitowoc
Norrborm, C. G. ..... Shawano

Nourse, H. ..... Bayfield
Novak, John ..... Langlade
Noyes, J. B. ..... Winnebago
Oakley, C. F. ..... Monroe
Oakley, H. A. ..... Monroe
Oakley, Mary ..... Dane
Obrion, Ellsworth ..... Wood
Olin, J. M. ..... Dane
Otterholt, Henry ..... Barron
Ovenden, Frank ..... Dane
Oviatt, Dr. C. W. ..... Winnebago
Owen, Thos. ..... Columbia
Paige, Mrs. W. S. ..... Dane
Palmer, J. S. ..... Sauk
Parsons, A. A. ..... Winnebago
Patterson, A. C. ..... Rock
Paulson, J. E. ..... Manitowoc
Pearson, C. L. ..... Sauk
Pederson, C. T. ..... Barron
Pederson, Peter ..... Trempealeau
Pelton, George ..... Sauk
Pelton, M. ..... Sauk
Peltier, Eli ..... Manitowoc
Perry, Howard E. ..... Jackson
Peters, John ..... Waukesha
Peterson, P. A. ..... Douglas
Pfaender, Wm., Jr. ..... Minnesota
Pfefferle, S. ..... Outagamie
Phillips, Thos. L. ..... Manitowowc
Philipson, C. ..... Winnebago
Pinner, John ..... Waukesha
Planta, R. F. ..... Illinois
Plumb, C. L. ..... South Dakota
Pomeroy, O. R. ..... Crawford
Popp, John ..... Manitowoc
Porter, J. M. ..... Winnebago
Port, Mike ..... Ozaukee
Post, Lewis ..... Dane
Post, Lawrence ..... Dane
Potter, A. ..... Vernon
Powell, E. E. ..... Monroe
Powell, W. S. ..... Monroe
Powell, W. S. ..... South Dakota
Proudfit, A. E. ..... Dane

Rahr, Wm. ..... Manitowoc
Ramsey, Mrs. Robert ..... Sauk
Rasmussen, N. A. ..... Winnebago
Rastall, Benj. ..... Richland
Ray, Joseph. ..... Dane
Reek, Joseph ..... Winnebago
Reeve, Dr. J. S. ..... Outagamie
Reis, John ..... Richland
Reis, Albert ..... Richland
Reis, W. J. ..... Richland
Reinking, A. P. ..... Sauk
Rhodes, Ed. ..... Outagamie
Rice, Wm. V. ..... Pierce
Richmond, Susan ..... Dane
Richardson, C. L. ..... Chippewa
Richardson, James H. ..... Illinois
Riegle, G. W. ..... Dane
Risley, F. F. ..... Sauk
Rentschler, Geo. R. ..... Dane
Robbins, Edmund ..... Racine
Rockman, N. M. ..... Barron
Rodwell, Thos. ..... Sauk
Roe, J. W. ..... Winnebago
Rogers, A. J., Jr. ..... Dane
Rosenow, Arthur ..... Waukesha
Ross, V. M ..... Crawford
Rounds, Mrs. S. A. ..... Winnebago
Roumelin, O. A. ..... Milwaukee
Ryan, Sam J. ..... Outagamie
Salzer, John A., Seed Co. ..... La Crosse
Sandsten, Prof. E. P. ..... Dane
Sansum, David ..... Sauk
Schenk, John B ..... Milwaukee
Scheutte, Fred ..... Monroe
Schnieder, A. ..... Wood
Schmelding, Henry ..... Milwaukee
Schmidt, Frank ..... Winnebago
Schultz, J. L. ..... Jefferson
Shadrick, J. T. ..... Dane
Shenandoah Nursery Co. ..... Iowa
Shephard, Elsom ..... Winnebago
Sherwood, O. A. ..... Crawford
Sherwood, J. O. ..... Forest
Shuckhart, H. ..... Richland

Simonson, L. A. ..... Minnesota
Skewes, E. B. ..... Racine
Skinner, Prof. E. B. ..... Dane
Skinner, Mrs. Lloyd ..... Dane
Smith, B. H. ..... Rock
Smith, Mrs. J. G. ..... Dane
Smith, S. L. ..... Winnebago
Smith, Howard ..... Waushara
Smith, E. B. ..... Waukesha
Smith, Mrs. M. J. ..... Winnebago
Smith, Dean ..... Jefferson
Sorenson, P. J. ..... Kenosha
Spencer, W. H. ..... Manitowoc
Sperbeck, M. V. ..... Winnebago
Spry, John ..... Jefferson
Stanley, H. H. ..... Sauk
Stead, Mrs. Joseph ..... Winnebago
Steensland, Halle ..... Dane
Steel, Lillie ..... Milwaukee
Stephens, James W. ..... Fond du Lac
Stephenson, Ole ..... Manitowoc
Stevens, Hon. Ray E. ..... Dane
Stewart, Blaine G. ..... Langlade
Stoker, W. L. ..... Monroe
Stone, Walter ..... Waukesha
Stone, A. L. ..... Dane
Straker, Edward E. ..... Manitowoc
Sumner, Ed. ..... Dane
Telfer, Joe ..... Jefferson
Ten Eyck, A. A. ..... Green
Tenney, H. A. ..... Dane
Tennison, Henry ..... Winnebago
Thulin, Edward ..... Sawyer
Thurston, K. W. ..... Monroe
Thwaites, Mrs. R. G. ..... Dane
Tice, Jess ..... Winnebago
Tice, Ray ..... Waushara
Tiplady, Walter ..... Walworth
Timms, C. J. ..... Green Lake
Tiefenthaler, G. E. ..... Milwaukee
Torgeson, Theo. ..... Vernon
Trettin, A. H. ..... Milwaukee
Tripp, J. N. ..... Monroe
True, C. H. ..... Iowa

Tucker, W. O. ..... Racine
Tulledge, Everett G. ..... Fond du Lac
Tuve, S. O. ..... Minnesota
Turville, Thos. ..... Dane
Twining, M. W. ..... Crawford
Twining, B. H. ..... Crawford
Tyler, Grant ..... Manitowoc
Uecke, John ..... Outagamie
Ullbricht, Edgar A. ..... Milwaukee
Umlauft, Rudolph ..... Clark
Updike, Rev. E. G. ..... Dane
Utter, Delbert ..... Walworth
Van Kirk, Ed. ..... Monroe
Van Kirk, Leon ..... La Crosse
Van Orden, J. ..... Sauk
Von Wald & Co. ..... Sauk
Waldo, Mrs. Flora ..... Manitowoc
Walker, George ..... Door
Warner, Ernest ..... Dane
Wayne, Joseph ..... Grant
Weber, Frank ..... Jefferson
Wegner, Wm. E. ..... Jefferson
Welke, Sam ..... Eau Claire
Wells, Mrs. George H. ..... Dane
Wengler, M. B. ..... Milwaukee
White, W. F. ..... Langlade
Whiting, George H. ..... South Dakota
Wild, Chas. ..... Sauk
Wilkinson, Alonzo ..... Bayfield
Williams, W. D. ..... Monroe
Williams, Mrs. N. ..... Winnebago
Williams, John R. ..... Waukesha
Williamson, W. D. ..... Dane
Wilsmann, Wm. ..... Manitowoc
Wilson, B. F. ..... Marathon
Wood, C. L. ..... Monroe
Wood, S. H. ..... Sauk
Wright, Mrs. A. O. ..... Dane
Wright, B. H. ..... Monroe
Wright, George S. ..... Eau Claire
Young, A. W. ..... Chippewa

BUSINESS CARDS OF MEMBERS.

Barnes, A. D., Waupaca, nursery and fruit farm.
Bingham, D. E., Sturgeon Bay, nursery and fruit farm.
Brown, A. D., Baraboo, nursery and fruit farm.
Brown Bros., Watertown, nursery.
Buehler, J. G., Twin Bluffs, fruit farm.
Bennett, A. E., Grand Rapids, cranberries.
Barnett Bros., Chicago, Ill., commission merchants.
Chappel, F. H., Oregon, nursery.
Coe, Converse & Edwards, Ft. Atkinson, nursery.
Columbia Co. Nursery Co., Fall River, Wis.
Downing, M. B., Milton, nursery.
Fancher, W. E., Corliss, nursery.
Ferguson, T. J., Wauwatosa, nursery.
Fieldhouse, Wm., Reedsburg, nursery and vineyard.
Foley, M. F., Baraboo, nursery.
French, Frank, Sparta, berry plants.
Hanchett, Wm., Sparta, small fruits and plants.
Harris, H. H. and Sons, Warrens, strawberry plants.
Hatch, A. L., Sturgeon Bay, nursery and fruit farm.
Hatch, C. A., Richland Center, fruit farm.
Johnson, Franklin, Baraboo, small fruits.
Jeffrey, Geo. J., Milwaukee, small fruits and orchard.
Jewett, A. P., Sparta, nursery.
Kelley, A. N., Mineral Point, fruit farm.
Kellogg, L. G., Ripon, nursery and small fruits.
Kellogg, Geo. J. & Sons, Janesvile, nursery and fruit farm.
Leverich, J. W., Sparta, small fruits and plants.
Loope, T. E., Eureka, nursery and fruit farm.
Mack, S. B. & Co., Monroe, nursery.
Manitowoc Seed Co., Manitowoc, field and garden seeds.
Marsh, W. H., Antigo, tree fruits.
McKay Bros., Pardeeville, nursery.
Meller, C. L., Milwaukee, landscape gardener.
Moyle, W. J., Union Grove, nursery.
Palmer, L. H., Baraboo, small fruits and orchard.
Pearson, C. L., Baraboo, small fruits and plants.

Philips, A. J., West Salem, nursery and small fruits.
Planta, R. F., Oak Park, Ill., arborist.
Pollworth, C. C., Milwaukee, wholesale cut flowers.
Post, Lewis, Madison, small fruits.
Ramsey, Robt., Baraboo, fruit farm.
Ray, Joseph, Madison, small fruits.
Reis, John, Ithaca fruit farm and nursery.
Richter, W. A., Milwaukee, landscape gardener and fruits.
Richardson, C. L., Chippewa Falls, small fruits.
Rentschler, F., Madison, greenhouse.
Rentschler, Geo., Madison, greenhouse and nursery.
Salzer Seed Co., La Crosse, field and garden seeds.
Sansum, David, Baraboo, market garden.
Shenandoah Nurseries, Shenandoah, Iowa.
Simon, H., Baraboo, fruit farm.
Sperbeck, M. V., Oshkosh, market garden and fruit farm.
Spry, John, Ft. Atkinson, small fruits.
Tamblingson & Son, Ft. Atkinson, nursery.
Toole, Wm., Baraboo, pansy specialist.
Toole Bros., Baraboo, seed corn.
Underwood, J. M., Lake City, Minn., nursery.
Utter, Delbert, Caldwell, fruits and vegetables.
Vaughn, B. M., Grand Rapids, market garden and small fruits.
Williamson, W. D., Madison, tree protectors.
Williams, Norman G., Shiocton, nursery.

EXCHANGES.

The Society has on file in the office of the secretary many of the leading horticultural papers, which are received in exchange for our reports and bulletins. The exchange list includes also the different Experiment Stations in the United States and many similar institutions in foreign countries. The Society solicits exchange of publications.

LIST OF PUBLICATIONS ON FILE.

American Fruits, Rochester, N. Y.
Barron County Shield.
Barron County News.
Better Fruit, Hood River, Oregon.
Country Gentleman, Albany, N. Y.
Farmers Review, 355 Dearborn St., Chicago, Ill.
Fruitman, The, Mt. Vernon, Iowa.
Farmers Voice, The, Chicago, Ill.
Fruit Grower, The, St. Joseph, Mo.
Green's Fruit Grower, Rochester, N. Y.
Northwestern Farmer, Menominee, Mich.
National Nurseryman, The, Rochester, N. Y.
Orange Judd Farmer, Marquette Bldg, Chicago, Ill.
Prairie Farmer, Chicago, Ill.
Rural New Yorker, 409 Pearl St., N. Y.
Wisconsin Agriculturist, Racine.
Wallace's Farmer, Des Moines, Iowa.
Wausau Pilot, Wausau, Wis.

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

SUMMER MEETING.

The Summer Meeting was held at Shiocton on August 28th, 1907, President R. J. Coe in the Chair.

The morning session was opened with prayer by Rev. Mr. Jordan.

The President then introduced Mr. W. D. Boynton, of Shiocton, who made the address of welcome.

ADDRESS BY MR. BOYNTON.

Mr. President, Ladies and Gentlemen:—I presume when this meeting was called for Shiocton some of you had to get out your map or atlas and look up that little place. If I recollect rightly, it is the smallest place that ever had the honor of a State Meeting of the Horticultural Society, and I assure you that Shiocton feels the honor very keenly. There are perhaps some reasons why it was brought here, say some three or four prominent reasons, and I think perhaps the leading one was the fact that Shiocton had

been taken hold of quite severely lately by some Chicago capitalists, or Illinois capitalists, who created a land company here for the purpose of developing some four or five thousand acres of our waste lands. President Bridge has been one of the motives or powers back of this gathering, he has advertised it very freely, and he has commenced and performed a very large and unique work in the way of drainage and land improvement, and this Land Company has brought here a very noted horticulturist, Mr. Crawford, of Ohio, and that is another very strong card that helped to secure this meeting for Shiocton. We have appreciated Mr. Crawford's presence here very much this summer. Not only is he celebrated as a horticulturist, and justly celebrated all over this country and has been in the work through a lifetime, he is known in every state in the Union, but he has written for all the leading agricultural and horticultural papers and wherever he has worked he has done good work, we may be sure of that. But he has also pleased us personally very much; we have found his kindly presence in the community a very great boon, and we cannot say too many good words for Mr. Crawford who has been carrying on the work for the Shiocton Land Company.

Perhaps another leading motive for bringing this meeting to Shiocton is the fact that we have here Mr. Eben E. Rexford, who has been a resident of this town all his life nearly, and who is also a writer of national and even international repute, and his especial work has been along the floral line, and this is a floral meeting. Mr. Rexford is the author of several noted books on floriculture, particularly those of an amateur character for the home flower grower, and Mr. Rexford has also attained considerable fame as a writer of verse and prose, so I think we may giver Mr. Rexford quite a bit of the motive of bringing this meeting to this place.

Now the conditions of Shiocton have been peculiar in the past. I want to give just a few words, stating why Shiocton should be noted particularly at this time. It is quite a small town, there are lots of larger towns in the State, but consider the fact that this was a tumble-down lumber town some twenty years ago, and consider the fact that in the late eighties and early nineties fires swept over these swamps. Swamps pressed up against Shiocton on both sides, the tamarack pressed into the village on the east and the same on the west, so that we have

been between two swamps until those dry years successive fires swept off the timber and succeeding fires completed what the first ones started, and from them it was burned clean, a part of the muck burned, part of the moss burned and it left it like a great prairie. People who owned these lands could plow a mile long furrow and they d'd so in a great many cases. Some of the outside land owners did not improve the opportunity of holding these lands, cleared as they were by the fire, but let them grow up to brush again, and so you see patches of brushes and very unsightly stretches of land. But these great fires left the ground coated with ashes and a great many people put grass in and it threw up tremendous crops of grass each year, then it subsided and we found we would have to go into those lands and farm and cultivate with manures like any other land, so the vegetable business naturally started in. We had started that before the fire in a mild way, but after these fires it opened up these large areas just adapted to vegetable growing, and C. A. Kerr of Chicago started in here and built a very large stone storage warehouse, and the farmers around here have been building storage since. Now we have a large storage capacity for vegetables; in rank this place stands next to Racine in the production of vegetables, and there is another point why the State meeting should come here. We now stand ahead of Green Bay on the production of coarse vegetables, and we must stand next to Racine.

We have found, as I said before, that our land needs fertilizing, we have also found that these lands needed drainage, very flat, low, level land, and the land was sour from the long succession of wet years after the dry ones, and it needed just the work that the Shiocton Land Company is putting in to demonstrate the value of these lands. They have instituted a large system of drainage, they made something like 6 miles of ditches, I think their plan called for something like seven or eight miles of canals these are canals twenty feet wide on top and ten to six feet deep; the plan is to lead into these drains by means of tile drainage to get the best results.

I simply want to say for myself that it is a very great pleasure to meet you here. I used to meet with the State Horticultural Society twice a year and have been in the work for a good many years and it is a great pleasure to meet you all here.

Speaking for Shiocton, I want to say there is nothing too good for you in this village. We appreciate the honor of your coming here and we appreciate the disadvantages we labor under; we have small hotel capacities and we have provided against that by going to private families and there is not a house that has a spare bed but that will welcome you, and we hope no one will go away tonight that wants to attend this meeting because they have not any room to stay. Shiocton is wide open to you and extends to you a hearty welcome. (Applause.)

The President—I am sure all the visiting horticulturists are very grateful for these hearty words of welcome. Horticulturists you know are good natured people, the best natured people in the world, and so then it is a great pleasure to us to come here and meet the horticulturists of Shiocton. We expect to have a good time, and I know we will not be disappointed. When the invitation was first extended to the Horticultural Society to meet here for their summer meeting there was a great deal of doubt expressed as to whether it would be wise to hold a meeting in a place of the size of Shiocton, because you know Shiocton is not the largest city in the state, but I see we have made no mistake; we are very much surprised and exceedingly gratified at the audience we have here this morning, it seems to me it is about the best attendance we have had at any horticultural meeting in a great many years, and so then we are glad to meet with you and we will be sorry to part from you.

BULBS, CORMS AND TUBERS.

E. G. ARZBERGER, Madison.

It has been the poets privilege to give expression to his fancies in regard to the beautiful and charming structure, like those surrounding you, which issues forth from bulb, corm and even from such an odd looking form as the tuber. He has painted for us the infloresences in beautiful similes and metaphors, he has crowned them with the best of prizes to express his deep felt sentiments. Yet little do those parts which possess the vital

elements, the wonderful life processes, which produce all the harmony and beauty which he sees and feels, seem to attract his attention. He probably considers this too crude and inartistic and has left it for others to describe in a more humble language. This is the theme assigned to me and I shall describe in a simple way the structures and functions of the bulb, corm and the tuber.

These plant structures must not be confused with the root or any of its modified forms as the tubercles; for the morphology and functions are utterly different from what is found in the root. In the plant there are usually two distinct parts, which can readily be noted, viz: the root and the shoot, the latter being made up of the stem and foliage system each of which may be highly differentiated. These three parts are distinctly shown in an ordinary living tree where the three parts, roots, stem and branches with leaves are quite apparent. In the bulb, corm and tuber there are present these structures in some form or other, altho they are not so large and distinct.

The bulb is considered as an erect underground shoot or sometimes called a leaf bud, the short stem of which is covered with relatively long and closely packed scale leaves. The internodes are hardly developed. The scale-leaves arising from the stem are usually thickened and form the conspicuous part of the bulb, and usually enclosing the stem. In the vigorously growing bulb, the roots originate from the lower part of the stem.

Bulbs are usually spoken of as scaly bulbs and coated or tunicated. The scaly bulbs are those in which the leaf bases are very narrow and elongated, lying adjacent to one another like the shingles on a roof, e. g. (Lillium martagon and album). The tunicated or coated bulbs have scale leaves, the bases of which are large, broad and concave and are so arranged on the bulb that the inner ones are entirely covered by the outer ones, for example, as in the tulip, onion and hyacinth. The structure of a bulb can easily be made out in any one of these. When such a bulb is cut down thru the middle, it is seen to be made up chiefly of swollen bases of last years leaves. Inside there are young leaves and the delicate flower bud which will expand with its flowers the next season. On the outside there are a few thin scale leaves. All these leaves originate from the fleshy stem at the base known as the "button" which gives off the roots from the lower part.

The scale leaves vary in number. In Gagea there is but one scale leaf covering the bud partially; in the tulip and Fritillaria it varies from two to five, while in the lilies and hyacinths there may be a great many. When fresh the scale leaves of the tunicated bulb are quite thick, but when old and dry they become thin and papery and peel off quite easily. Again on some forms the scale leaves are united as e. g. in Fritillaria imperalis.

The function of the scale leaves on bulbs and also on corms is chiefly as a storage organ. The young shoot, the base of which they cover, when it begins to develop, withdraws food material from the scales until the large foliage leaves emerge from the ground and are able to manufacture new organic material to be used as food, which is usually in the form of starch or glucose.

Bulbs are protected from drying up by the soil surrounding them, but it is also very essential that they be protected from the attacks of insects and various other enemies. In addition to the poisonous substances for keeping off their attacks further protection is offered by the exhausted and dead scale leaves which do not disintegrate completely, but remain as a protective covering. At times they form a rigid parchmentlike infestment or thick reticular and latticed strands remain as a sort of a mask within which the tender bulb is enclosed and protected. Examples of this may be seen in the Crocus, Gladilous, wild onion, leek and the tulip.

In the axil of the fleshy scales young shoots appear as buds which ultimately form the new bulb for the next year. These later buds often remain attached to the stem and produce flowering shoots so that it would appear that the same bulb continues to flower for many years, e. g. in the Hyacinth and Tulip. Again in others, the young bulb is detached forming a separate plant.

Midway between the bulb and the tuber is a structure known as the corm or solid bulb; common examples of this are the Crocus, Gladiolus and Indian Turnip. It is often mistaken for a bulb but usually because of its shape rather than structure. This is likewise a solid fleshy underground stem being related to both bulb and tuber. It is related to the bulb because of its short compact fleshy stem which is surrounded by a few thin scale leaves. In some forms these are entirely absent. From the fact that it is very short and fleshy, usually more or less rounded or

the name root-bulb is applied to it. It is in the fleshy rounded stem where a great deal of the surplus food is stored. The plant possessing such a structure is thus able to flower very early without waiting for foliage leaves to supply the food; or late in the season when it needs to depend but little on the activity of the foliage leaves, for example the Crocus and Gladiolus.

The corm usually bears one or more buds, the entire structure being surrounded by a tough tunic of scales. When the corm begins to grow, roots are sent forth from the lower end of the stem, the leaves and flowers of the buds expand, and the entire infloresence appears in view. Long after flowering the foliage leaves continue their work, preparing food which is sent down to accumulate in the new bud and stem which becomes swollen, forming a new corm for the next year's flower. When this is done the leaves die down their bases becoming the protecting scales for the new corm.

The corm like the bulb is only of one year's duration, sending off buds annually in the form of young corms. In the fall or after the foliage begins to die down, the young corm gives rise to leaves the lower of which form the ordinary protecting scales around the corm and flower stalk, while the upper leaves remain small. In the axil of these uppermost leaves the flowering stem develops and produces the flowers the following year. Meanwhile in the axil of the middle leaves on the corm, a bud, a new corm, is formed which enlarges at the expense of the parent, and thus the cycle of life goes on. All these structures are prepared long beforehand in a reduced form ready for the appropriate time to come when it may issue forth in all its glory as the "harbinger of spring."

Probably the structure that is most frequently mistaken for a root is the tuber of which the potato is the most typical and familiar specimen. The number of plants which produce and are produced by these structures, however, is not so great as that of the other two types. The tuber again is a form of an underground stem or shoot, which has become much thickened forming a spherical or ovoid structure filled with food material that has been manufactured by the leaves in excess of its immediate requirements. The true nature of the tuber is revealed by its buds or "eyes" as we commonly call them, which indicate the nodes that have been much pushed together and the internodes which

have become much swollen. This morphological nature is clearly shown by uncovering the underground shoot of the potato plant and it will develop into ordinary foliage shoots. And if the development of tubers is prevented by cutting them off or other means, the buds in the axils of leaves above ground will develop tubers. Thus showing clearly that the tuber is a stem, morphologically. The buds are spirally arranged, similar to the arrangement of buds on stems on other plants. This may easily be shown by inserting pins into the eyes and connecting them by a string. The eyes which we find on the outside of the tuber are actually axillary buds, from which the subsequent year's growth will be produced. The scale leaves as prominent in the bulb which represent the subtending leaf of the bud are so very small that they can only be distinguished on very young tubers. In older tubers they are almost insignificant, appearing as mere ridges, scarcely discernible externally. The scale-leaves are placed so far apart that a big clear space is left between them and they are never placed so close together so that they envelop one another as they do in the bulb. Another difference between the bulb and tuber can be noted in that the scale leaves are the structures wherein food is stored, and at the same time serving as a protection for the young bud; whereas in the tuber the food is stored in the distorted stem and the scale leaf has become rudimentary, having hardly any function at all. Another difference may be noted in that a majority of cases the young bulb arises in the axils of the scales and develop subsequently into new bulbs which are not removed from the position held by the parent. It is evidently an advantageous arrangement when tubers from which new plants arise, are formed at the end of long shoots, since the new structures, thus developed, are far from the parent plant where the soil has not been exhausted of its nourishment.

Most tubers, however, are very perishable structures. All those which appear as local thickenings of an underground shoot, as the potato, grow very rapidly and then have a resting period of about a half year. They perish completely after having developed shoots which unfold their green foliage above ground. Generally tubers are found underground, but not infrequently they are found above the soil in the axils of foliage leaves, e. g. in Lesser Celandine (Ranunculus Ficaria) where these tubers arise in half axils. Later they become detached as

Missionaries preaching the gospel of beauty in a neglected back yard. Sent by the parent plants on the other side of the fence.

Hybrid Rosa Rugosa, pink, double. A trifle more showy than the single-flowered type but strictly a June rose while the single form commonly blooms in autumn as well as in June.

the plant withers and in places where they are produced in great quantities they have given rise to a myth known as "Pototo Rain."

Thus in these three forms the bulb, corm and tuber, there are present many homologous structures some quite similar in structures and function. All forms are underground stems or shoots possessing the power to be used by the young plant in a future time.

The significance of bulb and tubers in the life history of plants, producing them, is to develop new vegetable and floral structures with great rapidity. For example a new plant completely equipped for work may be obtained in a very much shorter time than from seed. Such a habit if it may be so called enables these plants to take advantage of short seasons and still accomplish their life purpose. These plants have two distinct life aspects corresponding to a greater and lesser physiological activity; or a period of rest and one of great activity. One is exemplified in the bulb, corm or tuber, the other in bright fresh green foliage crowned with a flower displaying its beautiful colors. Nature has thus wisely made ample provision so that many of her floral as well as vegetable decorations of woodland, field and garden may outlive the many adverse conditions that might befall plant life, so that we may enjoy them in early spring, late in autumn and at all times during the summer.

DISCUSSION.

Mr. Toole: I would like to ask the Professor just what class the dahlia belongs in. I suppose we are all correct in calling it a tuber, and yet its growth is so different from the potato or rutabaga and the different things one can mention that have been always considered tubers, and I would like to ask if it is correct to call it a tuber?

Mr. Arzberger: We have many varieties that grade between the two; we have those that grade from the corn down to the tuber and we have some varieties that are neither, that you cannot call either a corm or a tuber, and then again we have so many tubers that shade off into structures that are something like that of a root. We have many wild plants that are some-

times called tubers; stems that are very hard to classify as one or the other.

Mr. Toole. I suppose that this is of interest to us horticulturists in an economic way, both the floriculturist and the gardener, because we can put away for their season of rest and store up these things, those that have stored up nutriment for the future we can store them up for our convenience without much care compared with other plants. But we have another class that no place is given to like the beet and such, how shall we call them? In wild plants you will find some that you cannot classify under any of the three classes. How shall we classify our beets and others? They are certainly not corms or tubers.

Mr. Arzberger: They are simply fleshy roots, simply enlarged roots holding food material.

Mr. Toole: It seems to me we ought to have a class name for them.

Mr. Arzberger: They are classified as fleshy roots.

Mr. Axley: A gentleman asked if the sweet potato was not a tuber; it is a root, there is no bud on the sweet potato.

Mr. Smith: I wonder if the gentleman has ever planted a sweet potato. He says there is no bud on the sweet potato; you plant one and the stalks come out all over it, and in large numbers on the sweet potato, I wonder where they come from.

Mr. Axley: That is right. There are a great many roots that you can plant and they will grow branches all over. You can take raspberry and plant a branch, it will form a root, any bud will form a root, some roots will form buds when they are put in proper condition, just the same as some stems will form roots, it gets the root stimulation through the soil just as soon as you bring it in contact with the moist soil, and the condition of the soil will stimulate the production of roots, as the case may be. You take any stem, you can put it in contact with the soil where the moisture is and that is going to stimulate production of root, and so under the right condition you can stimulate the production of the root plants. In regard to the sweet potato—now I am not a horticulturist, I have not been in that as a business, but all authorities call the sweet potato a fascicle root and the dahlia is a fascicle root, it is simply an enlargement of the root in which food is stored away, the proper stimulation comes by placing them back in the soil.

Mr. Tiplady. If you cut the eye off a dahlia, do you presume for a minute that the ground will stimulate an eye on the blind tuber?

Mr. Axley: No, not in the case of the dahlia, but I do mean to say that when you are cutting the eye off the dahlia you are cutting the stem; an eye is a bud and a bud is an undeveloped stem, and the base of the bud will develop roots and the other parts will develop the part that comes up above the ground.

Mr. Arzberger: I have always considered them as underground stems.

The President: We will go on to the next subject. I will announce the committees at this time: For fruit and vegetables, Dr. Loope, for Flowers, Mr. Button, of Lake Geneva.

THE CANNA.

MR. BUTTON, Lake Geneva.

Canna is a Latin word signifying cane or reed, Canna Indica, Indian Shot so called from the fruit which is a capsule containing hard black seeds. Order Scitamineae, a large genus of herbaceous perennials, a native of East India has a beautiful tropical appearance with its large green leaves and upright habit.

Canna Edulis is grown extensively in the Sandwich and other islands the root being used as a vegetable in place of the Arrowroot, also Canna Coccinea is used the same. Canna flaccida is a native of southern United States.

The Canna is very extensively employed in sub-tropical and other methods of summer gardening. They have very graceful habits and beautiful glossy leaves which gives a beautiful tropical effect.

In Lenist time, 1753, there were three varieties, 1793 there were 4 varieties, a Frenchman by the name of Bousheau in 1844 marked 64 varieties.

A new section was introduced in 1864 by Mr. Croset of France, then Mr. Crozy introduced his new Hybrid Canna Madame Crozy, soon after this time they were introduced into the United States

and by careful skillful hybridizing there have been many beautiful new varieties introduced. The new varieties outstrip the old, in fact they combine the gorgeousness of the Gladiolus with the beauty of the Dracaena and may be used with beautiful effect in the summer gardens as borders or on the lawn in beds of all shapes and sizes or as screens or dividers, or border to give color when the other plants are not in bloom or mingled among shrubs.

There are many new varieties introduced yearly to take place of the old ones but some of the old varieties live with us for many years. There is no more beautiful bed in a large spacious lawn than the Canna of one or more varieties and color and graded heights. The new varieties are gorgeous when used as screens or when placed in front of shrubs with their beautiful glossy leaves and rich colored bloom against the green foliage of the shrubs and trees. Few plants are more easily grown than the Canna or more quickly propogated and they will grow under most any circumstances, but to obtain the best results care must be taken to succeed. The canna is propogated from the root or by seeds, many of the newer varieties come fairy true from seed.

When propogated by root the roots should be separated with from 1 to 3 eyes as preferred and then started in a bed of sand or very sandy soil in a temperature of from 50 to 60, some prefer a high bottom heat and start late, but to get the best results start your bulbs in a bed the latter part of February and then when well rooted pot up in 4 or 5 inch pots and place in a temperature of 50 degrees and they will make a very strong sturdy plant ready to bloom in the spring and continue to bloom all summer. They will begin to bloom earlier than if grown with a high bottom temperature and obtained a weak rapid growth which is effected by transferring to the open ground.

If propogated by seeds the seeds may be planted in February in a warm place of about 60 degrees. If soaked in warm water for twenty-four hours germination will be materially stimulated or file the end of the seed. A light soil is suitable for the seed such as sand and leaf mould and when the plants have made two green leaves they should be potted off into three inch pots and placed in a temperature of 60 degrees or so during their earlier stages and shifted as required until planting out season. By this time they should make fine strong plants which will bloom all summer.

A good rich soil with plenty of moisture and drainage is very suitable for the Canna.

The Canna is also very effective indoors as a pot plant in conservatory or porch decoration. As their growing season is very long, for this purpose, they may be grown in from 8 to 12 inch pots and if well cared for will last a long time and be very effective.

The old varieties of Canna were grown almost exclusively for their foliage, as the flowers were very small and inferior, but the new varieties are a great improvement in both flower and foliage.

I will not stop to enumerate the old varieties. There is one old variety, La Grande Rouge. It has long narrow pointed leaves of a deep almost purple bronze, very upright habit which foliage has hardly been surpassed in the new varieties. Among the new varieties there are many and I will endeavor to point out some of the best and newest varieties for bedding purposes.

Alphonse Bouvier 4 to 5 ft., strong grower and crimson flower; Beaute Des Marcher, 5 ft., color, salmon pink; Buttercup, 3 ft., compact, bushy habit, free bloomer, bright yellow in color and a fine bedder, one of the best yellow; Chicago, 4 ft., one of the best red varieties, a large flower and free bloomer coming in early; Crimson Bedder, 3 ft., a fine intense scarlet, very free bloomer. David Harum, 3 ft., dark bronze foliage, flower rich vermillion, good grower and bedder; Egandale 4 ft., foliage rich dark bronze, strong, compact flower, spikes currant red, the finest bedding Canna of its color; Florence Vaughn, 5 ft., green foliage, one of the best type of the French Cannas, flowers a rich golden yellow, thickly dotted with bright red, it is a fine grower and a good bedder, one of the best; Madam Crozy, 3 ft., fine dwarf, green foliage, with bright flower, vermillion with yellow border, a good durable variety; Martha Washington, 3½ ft., green foliage, one of the finest pink Cannas, flowers extra large, rose pink, stands the sun very well; Niagara, 3 ft., good bedder, crimson flower, green foliage; President McKinley, 3 ft. green foliage, medium size flower, color deep crimson, a profuse bloomer; Queen Charlotte, 3½ ft., green foliage, rich orange, scarlet with gold band, fine strong flower, good bedder and free bloomer and stands the sun well; Souvenir D'antoine Crozy, 4ft., green foliage, flowers scarlet crimson, bordered with yellow;

Black Beauty, grown for foliage effect, flowers small, the broad tropical foliage is of the deepest crimson bronze, a fine grower, 5 to 6 ft., the best dark foliage Canna; Comte De Sachs, 4 ft., foliage deep bronze, green large flower and very bright and large head with a clear bright crimson scarlet, a continuous bloomer and a fine bedder; Express, 2½ ft., green foliage, flower a bright scarlet crimson, large broad petaled flower, immense compact trusses, the finest of all dwarf Cannas, a fine border Canna and bedder; Francois Nordy, 3 ft., green foliage, a good red; Papa Nordy, 4 ft., new French Canna, a strong upright grower and free bloomer, large round flower of a beautiful purplish crimson, spikes large and numerous and are carried well above the foliage, a magnificent Canna, a fine bedder and stands the sun well; Louisiana, 6 ft., foliage a glossy green, fine grower, fine large flower, scarlet, good bedder; Mont Blanc, 3 ft., large, beautiful white, the best white; Mr. Wm. F. Kasting, 3½ ft., color crimson, a good Canna; Allemania, 4 to 5 ft., foliage green, outer petals yellow with inside of bloom scarlet, orchid flowering; America, 4½ ft., bronze foliage, the spike very red and the flowers enormous with a yellow throat and petals of glowing red flamed purple, a fine orchid flower; Burbank, 5 ft., green foliage, immense flower of the orchid type, color a rich canary yellow, inner part of petals fine crimson spots, grand flower and bedder; Italia, 4½ ft., green foliage, color yellow and red, a fine orchid variety; Pennsylvania, a fine orchid flowering variety, color scarlet and yellow.

Among the newest varieties are R. Wallace, 4 ft., green foliage, a fine yellow, a good bedder, upright habits; Victor Lemoine, 3½ ft., color brilliant, garnet flower with purple foliage, very free flowering, a fine new variety, strong grower; New York, a beautiful new red Canna of enormous size, a promising variety; King Humbert, the finest of all Cannas yet introduced, foliage of the most beautiful bronze, very strong and robust growers, immense trusses of orchid flowers, standing high above the foliage, color bright orange scarlet. No Canna has ever caused such a sensation as this. It is a grand variety in every respect.

There are a great many more Cannas but I will not take any more time in naming varieties. We should all lend a hand to make the Canna even more attractive than it is at the present, and to develop the beauties and the grandeur of the varieties

which we still grow. There should always be a good place reserved for the bright and welcome Canna. Its fine foliage and continuous bloom should always be welcome on every lawn. The more you care for a Canna the better they like you.

The Canna is not like many other plants that have its flowering season and then bids farewell for that season, but when it commences blooms until frost comes and destroys it. Now let us one and all try to bring the Canna to the front and give it what it deserves and welcome it on every lawn and in every park.

DISCUSSION.

A Lady: I would like to ask if it makes any difference whether the roots are divided in the fall or in the spring?

Mr. Button: We usually divide in the spring, store in the fall and divide in the spring for convenience.

The President: How do you store them? I want to know how I can store them in my cellar. I have tried but never succeeded.

Mr. Button: Store them in any dry place, in dry sand; do not have it too dry, because the tubers are likely to dry up. In a cellar that is heated with a furnace it is hard to keep them, because they get too dry. They want to have a cool place. We just put them under the benches in a cool greenhouse and they always keep well.

Mr. Smith: I have stored cannas a great many times and always come out the same that the president did. Cannot the speaker give us some rule that will apply to some thing that we know something about? I think there are very few of us that know about keeping cannas. Will they keep along with potatoes, with beets, carrots and cabbages? Cannot you put them with apples, or something of that kind? Is there not some rule by which we can know, rather than not keeping them too wet or too dry. That is too much like a woman's recipe for a cake,—put in a little of this and a pinch of that and a little of something else.

Mr. Tiplady: I would like to answer Mr. Smith in regard to keeping the canna. The canna is a tropical plant and it would be very unwise and very foolish and with very small regard to

natural conditions, to try to keep a canna with potatoes. However, if you have a cellar that is neither too warm or too cold, that will do for potatoes. For cannas you must have it warm and dry, and you must watch the tubers as they go through the winter.

Mr. Smith: What temperature?

Mr. Tiplady: Temperature of sixty, or temperature of fifty; you can find cannas kept in both under the greenhouse bench; you will find at a temperature of 60 cannas will go through all right, you will find temperatures of 50 where they will also go through all right. It must be dry and reasonably warm and you must watch your cannas, go to them once and a while and see how they are getting along, same as you would with raising cats, the canna has life as well as a cat. You must catch that canna on the decline, not go to it after it is affected and dead.

Mr. Smith: I want to know what to do with it.

Mr. Tiplady: If your canna has dry rotted, it has been too dry for the canna, the chances are that you should have moistened it; if it is rotted with moisture, the chances are that you kept it too wet. If it is too cold it will die. When I say cold I mean below forty, that is strictly against the well being of the canna.

Mr. Smith: If it is too warm, say 70?

Mr. Tiplady: They will grow. If you see signs of growth you can retard that growth by making it colder.

Mr. Moore: In regard to keeping cannas—I do not give this as a rule, just telling an experiment the last couple of years in keeping cannas; we simply take the roots and throw them in a bunch into a cellar where the temperature is about 60 degrees, let them lie right there; we take them out and about 75 per cent of the roots are growing. We have done that for two years. I do not want to give that as a rule, but that is our experience. It worked for us.

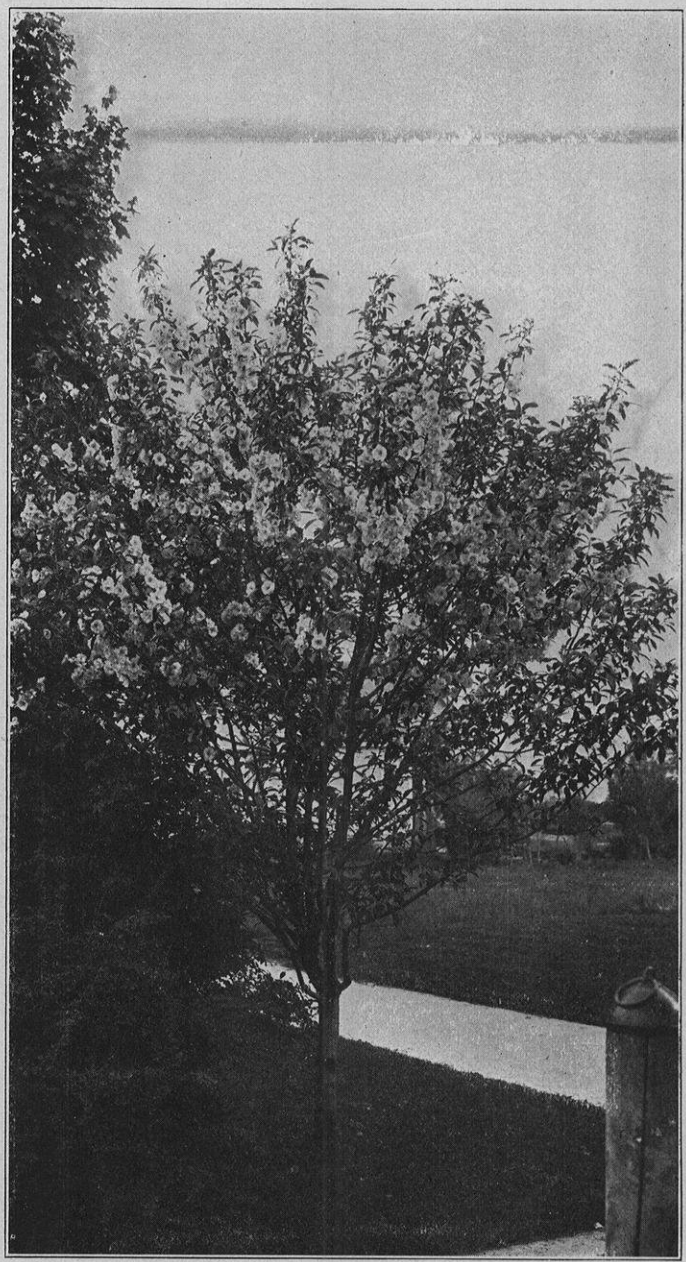
Mr. Rieck. I would like to ask if the cellar was light?

Mr. Moore: No, the cellar was dark.

Mr. Rieck: Was the atmosphere in the cellar dry or damp?

Mr. Moore: I could not say. It was a cellar which was too dry for keeping apples, too warm for keeping apples, and also the same for potatoes.

Dr. Loope: I wish to say this,—they may talk all they please



Bechtel's double-flowering Crab.

about this, and we have had the talk over and over again in all our societies whenever the subject of cannas has come up, but the fact remains that the average man cannot keep a canna; now that is a fact, a real fact, and I have given up trying.

Mr. Button: I will tell you the way we keep them; let them freeze down in the fall, the weather gets pretty cold before we start to dig, then we dig them right up, shake off the loose dirt, place them on the ground that is pretty nearly dry under the greenhouse bench and leave them there under the bench at about 50.

Dr. Loope: How far down do you let them freeze?

Mr. Button: Oh, say the ground freezes perhaps an inch, hard. I have kept them twenty years and hardly ever lose a canna. We never dry them entirely off. If you keep them in a dry temperature the chances are they will shrivel up and you will lose 50 per cent or more of them, but if you keep the temperature moist at 50, keep them in sand in the cellar, or you can keep them laid away in a corner of the cellar where there is a temperature of 50 and moist atmosphere, I do not mean wet, not so wet but what they will hold their substance, and then they will keep all right.

Mr. Rieck: Do you take all the soil off?

Mr. Button: Nearly all the soil off; we do not take it all off.

Mrs. Trevelen: I think there is a difference, in some seasons they keep better than others. I will tell you my experience in keeping cannas, and I have done so for several seasons. I take them out, as this gentleman said, just as the first frost comes—of course I do not have them on a large scale—but I put them into pails or boxes and I put them right in the cellar, the same cellar where I do my washing, and I let them dry out; there is a furnace in the cellar and I have kept them successfully through the winter, right in the dirt as I take them out.

Mr. Uecke: I have experimented somewhat with keeping cannas for the last three years. I have tried to keep them in dry sand, but I always find they come out minus in the spring, blackened and injured.

Mr. Henderson: We have found a great deal of trouble arises from the time they are dug. If you allow them to get frozen down too far, you will undoubtedly lose your cannas.

Mr. Uecke: Will you please specify the time?

Mr. Henderson. That I cannot tell you, but I know you must not let them freeze down to the ground while the stalk is about quarter ways from the ground, because if you let the frost get down to the bud or eye, your canna is gone. We go through our cannas constantly and any that are getting black put them right in the bench and start them. That is the only way we can save them. Of course seasons vary, frost comes earlier some seasons than others, but our men sit up nights watching the cannas. We have found that is about where the trouble is, or a great deal of it, anyway.

Mr. Smith: What is the nature of the canna root, is it root or bulb or tuber or corm?

Mr. Arzberger: It is a root-stock.

Mr. Toole: I would like to emphasize what has been said in regard to raising cannas from seed. I should say, soak them in hot water rather than warm water, but still more safely to file through the coating of each one, after that they germinate rapidly. You are not sure of what you will get, but you will get a bloom the same season, a fine, choice lot of cannas that are worth having, so that you are not particular about grouping colors together.

The President: It is not always that we have a Congressman with us. A Congressman I suppose is, or I suppose should be, like an electric light, all you have to do is to touch the button and get results. I will call on Mr. Kuesterman to give us a talk.

Mr. Kuesterman: This is rather taking me by surprise. I am a splendid listener, and I could have stayed here all day with you to listen, but I am somewhat backward in speaking. However, as matters are, I will meet the occasion the same way as the young lady who was asked how it was when she received the first kiss from her lover, "Why, she said, I met the emergency face to face."

Now let me say to you, that I am pleased above all to be with you, because I like flowers, I have always been greatly interested in gardening, and consequently I like those who like flowers. They have a proverb in German that says, "If you want to find good people, go among those who love music and flowers." That is, one that is charmed with sweet melody, one that is charmed with the fragrance of flowers, cannot be bad.

About two weeks ago I returned from a trip to Germany,

and while there, recollections from younger years came to me, and one of the most pleasant ones was our little garden. Now, my friends, while I say "Our little garden," it was not in reality our little garden, but over there they have very wise city government and they, knowing there are a great many poor people living in the city, my parents among them, they rented out garden lots to these people, say about 50 by 100 feet; oh, and how proud we felt of this, our garden. Why we never allowed any weeds to grow there, and in fact sometimes going there we were very sorry not to find any weeds, because we wanted to work. It is a splendid arrangement, and I wish they would introduce it in this country, to give everyone a garden, no matter how small it is. Over there they will even see to it that the poor people have their little orchards and they do it in this way,—they grow fruit trees along all the highways, everywhere you will find apples, pears, cherries, walnuts and all kinds, and before they are fairly ripe they say to the people, "We will rent you these trees, sell you the fruit for whatever you can afford to pay." My father went and bought, say, ten of those trees, and what a pleasure it was when the time came to take off the fruit. There was no trouble about people stealing the fruit, or boys getting away with a lot of it, because in the first place, they are quite law-abiding, and, secondly, they have good overseers to look after them, and so we always had our fruit, and I think it is an arrangement that would also pay in this country. Why not have fruit trees along your highways? It gives you fruit and it helps to bear the burden of taxes. Why, over there again and again they told me the taxes were paid by what they got for the fruit.

Now let me tell you about the smallest garden I ever saw in my life, it was one four by six feet, it was in a blind institute in Pennsylvania. The president of the state board of control and I looked over some institutions and there I found a lot of these little gardens for those blind children. One of them took me by the hand, a little seven-year old girl, and said, "Oh, I want you to see my garden," and there it was. And I tell you, it was touching. In the first place she was counting, there were marks she could not see, but she could find her garden, and when she came there she said, "Look at that beautiful rose," she could not see it, and then again she said, "You see that little tomato plant, now is not that growing nicely," and she felt of it, and in

bending down she said, "Oh, that nasty weed." She knew the difference between weed and plant, and so she kept her garden in splendid shape.

Now, my friends, it is not my purpose to delay you long, you are all waiting for dinner. However, I may say one more thing, that when in Berlin a short time ago I there saw a rose farm, twenty, thirty and more acres, all full of roses of the greatest and finest varieties. It is kept near Berlin and I understand was supplying the garden and the palaces of the emperor. It was certainly a sight to see so many acres of roses.

Now let me say, I was pleased and I watched with great interest the work of your Land Company here today, meeting some of the officers. I tell you they do deserve success, and for their own good and for the good of the town of Shiocton I hope that they will be successful in every way. It will certainly help to place Shiocton on the map, if it had not been there before, and I wish them success in every way, and I also wish you success in your proceedings here and I hope that they will be to the benefit of you all. I thank you. (Applause.)

AFTERNOON SESSION.

THE DAHLIA.

By Mr. A. P. LOEWE, Milwaukee.

In 1864 a Dutch dealer in bulbs received some Dahlia roots from Mexico, the native home of that flower. One of these roots produced a plant and flower entirely distinct from any Dahlia known at that time. It had a more slender growth, more delicate and graceful foliage than the old forms and an irregular, loose double flower, the petals being recurved at the margin so as to appear almost pointed. The color was a bright crimson,

similar to that of a garden cactus, cereus speciosissimus, which it also resembled somewhat in shape, and so it was called the Cactus Dahlia, botanically Dahlia Juarezin, in honor of President Juarez of Mexico. It was first pictured in the Gardeners Chronicle of 1879. The introduction of this new horticultural species brought about a great revival and renewed interest in Dahlia culture which had been at a standstill if not on the decline for thirty odd years.

The Dahlia had been known in Europe since 1789 when the original species, Dahlia variabilis of Linnaeus, was sent from Mexico by the great naturalist, Alexander von Humboldt. Of all our most important flowers it is, therefore, the last to have come into cultivation. Strange to say the flower showed some signs of doubling the very year of its introduction, probably a result of the change in climate, but no progress was made along this line until 1814. Within the 25 years following this date, however, enormous strides were made. By 1840, probably three thousand varieties had been catalogued with a range of color including every shade except sky-blue and the allied hues. The ideal sought and developed to the utmost was a very double flower, as round as a ball, on a stiff stem, and the petals perfectly regular. When this ideal had been perfected, the possibilities of the flower had been exhausted and as the singles and semi-doubles were hardly thought worth cultivating, nothing new was offered for about 39 years.

The introduction of an entirely new form was necessary to reawaken interest in the flower. The cactus dahlia filled this requirement and furnished unexcelled, almost limitless possibilities to the plant breeder, as is shown by the immense number of new varieties which have been and are still annually being brought out by seedsmen.

The modern Dahlias are, therefore, the descendents of two species and their hybrids. All Dahlias today may be classified according to Bailey into nine divisions. The oldest and the ones given the most attention by the horticultural societies at the shows are the Show and Fancy types. These two classes are the old perfectly double and regular, ball shaped flowers, differing only in color. A Show Dahlia is self colored or if tinted the edges are darker than the ground color. A Fancy Dahlia is always parti-colored, the edges always lighter than the ground color. Similar

to the above but with smaller flowers and greater numbers of them, with the plant generally more dwarfed is the Pompon type, also known as the Boquet or Lilliputian Dahlia. Then there are the Cactus and Cactus Hybrid or decorative classes. The Cactus varieties of which a Pompon form is also current, are still practically the same as when introduced except that all the colors of the Show and the Fancy type have been extended to them also. The Cactus Hybrid or Decorative means practically miscellaneous, for all kinds which do not come under the above classes are placed here, except of course the Singles and Tom Thumb kinds.

The Single Dahlias are generally divided into Standard Single and Single Cactus but some go as far as to set apart Show and Fancy Single according to the ground color and the edgings. A new form which is modified Single is the Collarette Dahlia, a single flower with a row of two small flowerets at the base of the large petals, sometimes of the same color as these, sometimes of a vividly contrasting hue. In the latter case they are very beautiful and odd.

The Tom Thumb Dahlias are very dwarf plants with an immense number of immature Show or Fancy flowers and are used mostly for bedding, though they keep well when cut.

The three classes which have recently received the most attention and have been the most prolific of new varieties are the Cactus, the Decorative and the improved Singles, such as the Twentieth Century varieties. Especially the Decorative Dahlia with their long stems, loose double flowers, and brilliant color, combined with good keeping qualities when cut, make a most desirable subject for both the gardener's and the florist's care. They are the Dahlias of the future.

PROPOGATION.

The Dahlia is a tender, tuberous rooted perennial, and the easiest and most satisfactory method of propogation for amateurs is a simple division of the roots. But there is one difficulty. The eyes or buds are not on the tubers but on the stem above them and it is necessary to secure at least one eye with each tuber. Therefore they should always be divided in spring and very often not until the tubers have been put into a warm place for a short time so as to start the buds and leave no doubt as to where they are located.

Another method employed chiefly by seedsmen and not practicable unless a greenhouse or hot bed with bottom heat is available, is by cuttings. The old roots are set in a bench in January and as the shoots grow they are removed as soon as they have three or four sets of leaves. They are trimmed and placed in a cutting bench with a bottom heat of 65 degrees, rooting there in about two weeks. This temperature causing somewhat slower rooting is preferable to a higher temperature for a shorter period, as recommended by some growers and gives better and stronger plants. When rooted the plants are potted in small pots and as soon as the weather permits are planted out of doors. By fall these cuttings will have produced what is known in the trade as field grown roots.

Dahlias as a rule produce seed quite easily but varieties do not come true so that this method of propogation is used only when new varieties are sought. Ordinarily it takes an experienced gardener to produce new varieties of the double kinds worthy of cultivation but it is an easy matter and a pleasant experience to raise the single varieties from seed, the variations and combination of colors, blotches and stripes seem inexhaustible though very few are of a sufficient grade of excellence to be named. If the seed which generally germinates easily, is sown early in doors in boxes or in a hot bed and later set into the open ground, flowers may be had the first year, though in the case of promising kinds, it is advisable to keep them another season to see them at their best.

In the case of very rare new kinds where a valuable specimen has met with an accident, grafting is sometimes employed to perpetuate the variety. That is, a slanting cut is made on the portion of the stem to be used and a similar one on the tuber, the two cut surfaces are placed together and tied with some soft pliable material. The grafts are then potted sufficiently deep to cover the union and put into a close frame. If available the terminal portion of a shoot is taken and trimmed similar to a cutting.

CULTIVATION.

In a general way the Dahlia does best in a sunny, airy location and a sandy loam with good drought resisting qualities which must, however, contain a goodly amount of plant food. Being

a strong, robust grower the plant is not very particular as to the form in which the fertilizer is applied so long as it is available. Of course the purpose for which they are set out affects their location and treatment of the plant.

Where the dwarfer kinds are planted as bedding plants, for mass effects or edging, a thorough deep shading of the soil, working in at the same time a liberal amount of horse or cow manure will generally provide all the plant food necessary. The earlier this is done in the spring the more moisture will the loosened soil absorb and the better will be its drought resisting qualities. The dwarf kinds may be planted almost anywhere under the above conditions if set quite closely and pinched repeatedly to form bushy plants, will give a profusion of small well colored flowers.

With the medium sized or tall varieties especially the heavy, large flowering kinds, protection from high winds is exceedingly important. The ground is prepared in a similar manner, though generally made richer than for the bedding kinds but the individual plants are given more room, fewer shoots are allowed to grow and for the finest specimens only a few buds are allowed to remain on the plants. The exact time for planting out dahlias is a point of contention among growers and I presume there is hardly a dahlia specialist who has not his favorite methods of dividing, pruning or pinching by which he produces his best flowers. One way to plant them out is to divide the tubers as soon as the buds are clearly discernable, placing them in the ground so that the crown of the plant is 4 to 5 inches below the surface, covering lightly at first and then filling in the ground as the shoots grow. Another method is to wait until later in the season, dividing the tubers early and allowing the shoots to grow two or three inches long and then planting them out.

The number of shoots which are allowed to remain varies also with different growers. Lawrence A. Peacock in his book, The Dahlia, which is probably the best and latest American treatise, advises the removal of all but the strongest shoot. He says "As soon as the shoots appear remove all but the strongest and pinch that off, forcing it to branch at the surface of the ground. Thus the entire strength of the root and soil is concentrated in the one shoot, while the pinching causes it to branch

"Bleeding Heart is one of the choicest memories of old-fashioned gardens. It is an altogether lovely plant." W. M., in Cyc. of Hort.

Sweet William, dianthus barbatus, an old time favorite.

at the surface, bracing it without staking and preventing all the first imperfect short stemmed flowers that appear on some varieties." The method does away with the unsightly stakes, though some of the taller kinds may need a short support if at all exposed to winds.

For nice specimen flowers, a shallow stirring of the soil as soon as it becomes hard or baked is absolutely imperative and it is far better than watering. Of course in a severe drought it will become necessary to water the plants, especially if in bloom, but as a regular practice it will not give results as good as a light stirring of the soil. The standard top dressing when the flowers begin to appear is pure bone meal and nitrate of soda, 4 parts bone to one of soda. This fertilizer on a retentive soil with an occasional heavy watering when necessary will produce the finest dahlias and plenty of them.

The Dahlia has few insect enemies but those few are hard to combat when they appear. Among them are the tarnished plant bug, which gets into the stems, the cut worm which eats off the young shoots, the black aster beetle and last but not least the grasshoppers will work havoc among the flowers if they are at all plentiful.

The Dahlia today is one of our most important flowers and is continually gaining in favor. It is pre-eminently an amateur's flower, for unlike our other floral beauties, the rose, carnation and chrysanthemum it needs no greenhouse, no winter home except a frost proof cellar, storage or pit. Once a beginning is made, with an occasional division the roots will last indefinitely. But this beginning is what has puzzled and driven many a would be dahlia grower back to bestow his efforts on other floral pets. Dahlias are offered in the trade today in four forms, five counting seeds. Of plants we have the large clumps, the field roots, pot roots and green plants. Every one is familiar with the large clumps of several years' growth which are sometimes offered. Their very size limits them to a local trade or exchange among collectors and specialists. The field clumps are the usual form in which dahlias are purchased in this country but as the demand is increasing steadily, the growers are finding it impossible to keep up, and many leading houses in the east have adopted the European plan of pot roots. When the cuttings as described above are removed from the cutting bench and potted they are

not set out into the open ground when the weather permits but are repotted into larger pots and grown thus for the whole season. The confinement of the pot causes them to produce two or three solid, round tubers 2½ inches through. These pot roots are cheaper than field roots and are shipped for very much less. Many prominent growers have endorsed them and think them fully equal to field roots, though usually not until the second year, but as Peacock says "the roots are easily kept from year to year and the main object is to get the best varieties regardless of the form in which they are offered." Green plants are used mainly to fill vacancies or a shortage in varieties.

VARIETIES.

Now as to the varieties. With innumerable catalogs flooding the country and the larger houses offering from 200 to 500 varieties it seems futile to try to set up a small list to include the best kinds. But there are some kinds which stand out prominently for their excellence.

Of the Cactus varieties:
- Aegir
- Strahlen Krone
- J. W. Roach
- Krumhilde
- Brunhilde
- Niebelungen
- Winsome
- Hahenzollern
- Countess Lonsdale
- Mont Blanc
- Thomas Parkin

Show:
- A. D. Livoni
- Burgundy
- Pink Dandy
- Storm King
- Willie Garrett
- Honest John
- Ruby Queen

Of the Decorative:
- Black Beauty
- Black Prince
- Countess of Pembroke
- Grand Duke Alexis
- Mrs. Vanden Dael
- Mrs. Roosevelt
- Nymphea
- Prof. Mansfield
- Pearl D'or
- C. W. Bruton

Fancy:
- Frank Smith
- Lottie Eckford
- Penelope
- Uncertainty

Mr. Loewe mentioned two or three methods of propogating the dahlia, I would like to ask him which he considers the best method.

Mr. Loewe: That all depends upon the purpose for which you want them. For an amateur wishing only a few plants, the division of the roots is certainly the best method. For a seedsman or specialist who grows a great many plants, the growing of them from cuttings is probably the best, it certainly is the quickest way of multiplying, and a great number of cuttings can be secured from a single old plant, and if repeated plantings are made, that is to say, if the shoots are broken off if they get two or three leaves, a great number can thus be secured, and I think that is the method that is employed by all the big eastern houses.

Mr. Tiplady: Don't you believe that that is the best method?

Mr. Loewe: Well, I have heard it stated this way: We grow all our other plants, take the rose, carnation, chrysanthemum, we grow all of them from cuttings when we want the best flowers; why should not we grow the dahlia the same. Now, that is a good argument. It seems to me a pretty hard thing for an amateur to grow dahlia cuttings.

Mr. Arzberger: Mr. Loewe has used the term "tuber" and "root" in his discussion of the dahlia, and I wish to ask him whether he wishes to use the term "tuber" in the scientific form, or scientific meaning, as applying to the underground portion of the dahlia.

Mr. Lowe: You will find those terms used very loosely, and I know very well the dahlia is not a tuber, but you will find that term used mostly that way by writers on that subject; I suppose it is a bit of carelessness, but I use it in the same manner, it certainly is not the technical sense that is employed there.

Mrs. Carpenter: I would like to ask the method of keeping the roots through the winter.

Mr. Loewe: If you were here this morning and heard the discussion about cannas; you probably know how to keep dahlias, because, so far as my personal experience goes, it is very much the same thing. Some people can keep dahlias and others cannot. We have always stored them in a cellar with other things, pretty damp cellar, in fact, generally with apples and in the same cellar with our potatoes, and we have had fair success, the only trouble we have had is with their dry-

ing up, even in a pretty moist cellar they would shrivel up, and the buds would not grow when planted.

Mr. Smith: We used to have dahlias quite often, and quite frequently had the same success that we did with cannas. I think somebody said, throw them among your potatoes and you would not have any bother and after that we never did. Any cellar that will keep potatoes in good shape will keep dahlias, and we immediately applied that and the dahlias always come through in reasonably good shape. Of course occasionally there would be one rotted, the same as in potatoes, but ordinarily speaking, they came through in good shape.

Mrs. Howlett: Is it not reasonable to suppose that the dahlia will grow stronger from the tuber than from cuttings? I have had experience in both, but it seems to me that the tuber gives strength to the plant and grows considerably faster and larger than the cutting. If it is trimmed off, not letting too many sprouts grow from the tuber, just one shoot growing from the tuber, I think it is better. I have never grown them very extensively, but still that has been my experience.

Mr. Loewe: It seems to me it is a hard thing to compare those two methods, because the cutting should be started some time in early spring, all the way from January to March and is set out when the weather permits a live plant to be set out. I know quite a few people who set out their dormant roots two or three weeks before the danger of frost is over. Now, the difference in the time of planting, and the length of the time of growth the different plants have would make it hard to compare them, it seems to me.

THE GLADIOLUS FOR THE PEOPLE.

MR. M. CRAWFORD, Shiocton.

The gladiolus is a native of South Africa, western Asia and southern Europe. It is at home in all parts of the United States and is here to stay. It is indispensable wherever known. It is easily grown, succeeds on any soil and is not liable to the attacks of insect pests or fungus diseases. It may be planted from early spring until July, and may be had in bloom in this climate from the middle of July until freezing weather. As far south as the Ohio river it may be planted ten inches deep and left in the bed for years—until it gets too close to the surface. Every year the new bulb forms on top of the old one, so it rises about an inch annually. If a late frost cuts the young sprout to the ground it continues to grow just the same, and is not discouraged by being cut back repeatedly. If the bulb is planted wrong side up it grows about as well; and if it has to stand in water for days or endure drought for months it will make the best of its opportunities, giving an abundance of bloom. When the first few flowers open, the spike may be cut and kept in the house as well as on the plant, giving constant bloom for one or two weeks according as the weather is warm or cool. As a flower to ship it is unequaled as far as I know. We have sent it from Ohio to Montana in good condition. Many tons are shipped to the cities in the summer and fall where they are purchased by rich and poor and used for all purposes.

Fortunately this meeting is held when the gladiolus is in bloom, so I will not attempt to describe it. You can see it for yourselves and decide as to its merits. These flowers were grown in Shiocton from bulbs shipped from Ohio last spring. They were long on the way and were planted very late and in soil too wet to work to advantage. Still they bloomed. They always do.

Now a word in regard to their culture: The bulbs must not freeze at any time. They may be planted early in the spring and covered six inches. This will prevent their blowing over when in bloom. While growing the gladiolus needs the same care that other crops do. It is not well to plow under rank

manure, but it may be put on the surface after planting. Other things being equal, a bulb is valuable in proportion to its vertical diameter. A bulb which has not bloomed is roundish or conical, but a thin, watch-shaped bulb has bloomed and possibly ripened seed. A conical bulb three-fourths of an inch in diameter will produce as fine a spike as a larger one and will cost much less. Half-inch bulbs usually bloom, but they are not retailed lest the purchaser might think himself cheated.

Cutting off the spike when the first flower opens—without cutting the foliage—relieves the drain on the bulb and allows it to grow larger and thicker. Take up the bulbs in the fall, cut or break off the tops and spread where they will dry without freezing. Then they may be put in the cellar, not over four inches deep, in boxes, crates or baskets. After two or three weeks they may be cleaned—the roots and old bulbs removed. It is not best to keep them too near the furnace. The bulblets may be saved and sown in the spring like peas if one wishes to increase his stock rapidly.

We can not determine the value of a gladiolus by weight, measure or chemical analysis. When it appeals to our taste we call it beautiful and admire it although sometimes we can hardly tell why. However, there are certain characteristics that are generally conceded to be desirable, among which are the following: healthy, vigorous growth, with tough foliage not easily broken by the wind. The leaves should be ample so as to build up a large bulb, and if they grow upright without drooping so much the better. The spike should be tall and straight with ample capacity to take up water to sustain a good number of open flowers. The flowers should face one way, and be so arranged on the spike as to make a broad and compact appearance without crowding. The size is not so important, but most people prefer good sized flowers. It is very desirable that the petals be thick so as not to wilt easily.

Color is of great importance. If that be unsatisfactory all other good points that it may possess go for nothing. Whether light or dark let it be clear and pure—not muddy nor faded looking.

When a person becomes interested in the gladiolus he wants to obtain a collection of good varieties. The quickest way is to buy named sorts, for the presumption is that a name is never

given to a variety unless it possess merit. One can spend quite a sum of money in buying named sorts, but if he wants to economize he can buy seedlings for about a dollar per hundred and select from them the ones that please him best. Where two or more friends or neighbors are interested they can exchange to the advantage of both. The most satisfactory way, however, is to raise seedlings. A thousand may be grown on a square yard, and the second year they may be advanced to blooming size on a rod of ground. No two will be exactly alike, and many of them will be fine. Sow the seed as you would lettuce, about the first of May, and give some shade until the young plants appear.

DISCUSSION.

Mr. Rieck: I would like to ask what soil he prefers.

Mr. Crawford: Soil that will produce any ordinary crop is all right for growing gladiolus. I have never found any soil that was not suitable.

Mr. Rieck: If you have a good rich soil, that is, stiff clay, would it be preferable to lighten it up with a little sandy loam?

Mr. Crawford: I would rather have a sandy loam for easy working, but my varieties in Ohio have grown on clay and they grew just as well, although it is a little harder to produce them.

Mr. Rieck: Do they prefer a moist soil?

Mr. Crawford: They will endure as much drouth as anything I have ever raised.

Mr. Boynton. I would like to ask Mr. Crawford if he ever saw any soil that equalled the Shiocton soil for the raising of gladiolus?

Mr. Crawford: Never saw any soil that was nicer to work than this, but I have seen soil a thousand times that would grow just as good bulbs and flowers. The soil here in Shiocton is nice soil to work as any I ever saw.

Dr. Loope: I would like to ask Mr. Crawford a question. Looking at the variety of the gladiolus that he is growing, and the beauty of them and their excellence, whether he practices hybridization in the ordinary sense of the term, as used by growers.

Mr. Crawford: I let the humming birds do that; I raise the seed and sow it and get hundreds of different kinds, but I do not call myself a hybridizer, I have not got that far along yet. As to the fertility of the land, I have always held that a gardener should assume that the land is there as a reservoir to hold plant food, to furnish anchorage for the plant and for the cultivator to furnish that plant food, and my experience is that when you depend upon the soil to furnish the food and the anchorage both, without applying any extra plant food, you are liable to be disappointed. We ought to be content if we have nice soil to work, that is moist enough and all right, therefore we ought to be content to furnish some plant food.

Dr. Loope: I would like to have you tell the people here your idea of the question of hybridization; whether it is possible to secure so very greatly superior bulbs and flowers from hand pollenization, or whatever they do, or whether you would trust to natural selection. The question of course is directed to the idea that some growers in the United States place a great deal of stress upon hybridization, whether that is better than the natural selection.

Mr. Crawford: It is very natural for some people to insinuate in some way or other that it is an advantage to buy their stock; I have seen many a person of that kind, and the thing will sell a little better if it is sold as a hybrid than it will if it is sold as a seedling; it is a little more scholarly, somehow, and it looks better, but I remember that Mr. Garland (?) of the Rural New Yorker, said that much of the seed sold as hand hybridized seed was no better than the seed that another person sold and did not claim it was hand fertilized. When Mr. Groff raised his first bedded seed, fourteen ounces the first year, he was unknown to the trade and he wanted to know if I wanted to buy it at $1.00 an ounce. Well, of course I did, because I had been offered seed that winter at $26 an ounce, so I bought all of Groff's hand fertilized seed, and I have always said it was a very excellent lot, but if a humming bird carries the pollen from one plant to another and it is perfectly pollenized, it is just as well as if a scientist carried it, or if the president of the United States carried it.

Mr. Moore: I would like to ask Dr. Loope, in his use of the term "hybridization" do you really mean hybridization, or cross pollination?

Dr. Loope: It is more cross pollination, of course; I am not a stickler, but the question that I wanted to get at he has answered perfectly, the idea of the people who advertise pedigree plants.

Mr. Moore: That is what I thought he meant and that you meant, cross pollination and not hybridization.

Mr. Crawford: I consider that when two species are crossed, then you produce a hybrid, but most of our varieties already have the blood of two or three species in them, and it is pretty hard to tell when you have a hybrid or simply a cross and there have been a great many hybrids produced that did not have anything that was worth anything, and we have only three or four of the species that have entered into the cultivated varieties, and the blood of these species that have not done us any good so far, the better off we are, and you can call them hybrids if you want to, at $15 a hundred, and you can call them crossed if you sell them at $2 a hundred.

Mr. Toole: I wish to ask, if a person wants to keep up a long season of bloom of the gladiolus, whether you recommend a succession of planting, or having early and late strains, or can we use both ideas?

Mr. Crawford: Well, we have a long succession of bloom by planting different sized bulbs. We plant our smallest stock first, and then the larger and then the largest, and the largest bulbs will bloom in 60 or 70 or 80 days, and the smaller bulbs will require ten days longer, or twenty, and the half-inch bulb will require a month more time to come into bloom, so we have a constant succession of bloom of the same variety by planting different sized bulbs at the same time, but if you are buying bulbs, it is a good plan to plant some every week right along, then you will have a succession.

Mrs. Barnes: I would like to ask how far apart he plants his gladiolus in the row, and how far apart the rows?

Mr. Crawford: For convenience in growing large bulbs, we have the rows three feet apart, so that we can cultivate them with a horse. If the stock is smaller, and we are simply growing bulbs, not flowers, we plant them very close, 100 to the foot. My rule is to plant them as far apart as the diameter of the bulb; if they are an inch in diameter, plant them two inches apart, so that there will be an inch space. Sometimes in planting little

bulblets, not larger than small cherries, I have grown them 200 to the foot. When they are two inches in diameter, plant three to the foot.

DUTCH BULBS.

MR. HENDERSON, Chicago.

The subject which has been given me comprises such a large list I have decided to confine my remarks more especially to Hyacinths and Tulips, giving to the best of my ability the history, method of culture and propagation in Holland and also a few remaks on planting in this country.

The Hyacinth or Hyacinthus is a genus of bulbous plant which comprises about thirty species of which three are natives of southern or tropical Africa and the rest of Asia Minor, Syria and Persia. The few cultivated species are native of the region east of the Mediterranean Sea and among them is Hyacinthus Orientalis which has become naturalized in southern Europe and is by far the most important. This is the variety which was introduced into Holland probably about the beginning of the 16th century; in fact about the beginning of the 18th century it stood almost first in popularity among florists' flowers, and many new varieties were produced. Then, as now, Holland, owing to its favorable climate and soil conditions was the principal Hyacinth growing country.

Tulip is a genus of bulbous herbs found wild along the northern shores of the Mediterranean in the Levant Armenia, Caucasus, Persia, Central Asia and Afghanistan. The Tulip was introduced into Holland probably about the 16th century from the Levant by way of Vienna and Venice. There is a legend that an Antwerp merchant to whom bulbs were sent cooked them for onions; and to this day the natives of some parts of Persia and Afganistan use the bulbs of Tulip Chrysantha for food.

During the 17th century the "tulipomania" was at its height and fabulous prices were being paid.

We read of the "Semper Augusta," which was sold for about

Hyacinths growing at Lisse, Holland.

$4,500 of the "Admiral Enkheuzen," which with its offsets brought $2,500, of the English tourist who had to pay 4,000 florins for an "Admiral von der Eyck," which he had thoughtlessly peeled with his pen knife, or of the sailor who ate with his raw herring a bulb worth ten years of his earnings, under the idea that it was an onion, and "a rather poor one at that." Those days are past. It is questionable if many florists would know a "Semper Augustus" if they saw it. All the Tulips sold in the Netherlands do not bring a fourth of the 10,000,000 guilders which a single Dutch town in those days cleared by one year's sale, and a speculator would require to make a very close "corner" in bulbs before he could hope to net the 60,000 florins which the Amsterdam speculator won by his ventures in the course of four months.

The Tulip mania died hard. As late as 1800, it is said that 15 guineas were given for a "Don Quevedo," and as late as 1835 a single "Fannie Kemble" brought at a London auction £75, while a Chelsea nursery man priced another at as high as 200 guineas, though whether he sold it is not mentioned. To the florist of today who buys his tulips at from $10.0 to $20.00 a thousand, the fabulous prices named seem wonderful indeed, although there are some varieties of late flowering Tulips and Narcissus which list in Dutch Cataloues at from 10 shillings to a guinea each.

Having given a few details as to the origin and history of the bulbs we will now take up the method of cultivation. While it is quite possible that these bulbs can be grown successfully in other parts of the world, there is no question that Holland is and has always been a most suitable place for their culture both in soil, climate and the fact that for generations every man, woman and child in the bulb growing district has been thoroughly acquainted with all the different methods of preparing the soil and cultivation. Holland as everyone knows is a flat country below the level of the sea and is intersected with numerous canals and ditches which in turn are pumped by windmills into the larger or main canals, these being generally from eight to ten feet above the level of the surrounding country. The bulb district does not extend over the whole country but is confined to a narrow strip along the seashore, say about one to four miles inland, in fact I am reliably informed that the best Hyacinths are raised close up to the dunes.

The soil in the district is practically pure sand, and the bulbs being gross feeders the ground has to be heavily fertilized and well cultivated before an attempt is made to plant. When a new patch is being put into shape it is first well trenched with the spade (by the way the spade is the only tool used by a Hollander in bulb cultivation, the plough or cultivator being an unknown article) and manure is then applied, the only fertilizer used up to the present time, being cow manure and although the price owing to the heavy demand has about doubled in recent years it will be sometime before any change is made as properly used it gives the best results. The application consists of about three wheelbarrow loads applied to every twelve square yards; this is spaded in and the following spring planted with potatoes sometimes with Anemone and Ranunculus. As soon as this crop has been harvested the ground is dug again, this time to a depth of about eighteen inches and the beds are then made for bulbs; these beds are always about 4½ feet wide, the length being generally determined by the size of the field (these fields range from ¼ to 1 acre in extent and are nearly always surrounded with hedges which act as windbreaks). Narrow paths are dug out on each side of the bed which in turn lead into larger and deeper paths at the ends and down the center of the field. This is for convenience in planting, weeding, etc., and more especially for drainage the rainfall over there being something that one likes to talk about better than experience.

This preliminary work is done by special men who are very expert and can lay out the ground with mathematical accuracy.

The beds now being ready, planting is commenced, the date varying according to the season, but generally being about the 15th of September, Hyacinths being the first bulbs to be set out. They are planted in rows at different distances according to size of the bulbs. If first size Hyacinths are wanted (these run from 19 to 21 centimeters in size) seven bulbs are set out to the row which makes it about eight inches apart each way; if for second size (17–19 centimeter) about nine bulbs are set to the row and so on.

The depth of planting varies according to the way the land lays, if on low land shallow planting is in order and on high land the bulbs can be set deeper, the average depth being, however, about four inches below the surface. The bulb now commences

Narcissus Poeticus growing in Scilly islands for the English market.

to make roots and owing to looseness of the soil, they will often go down eight to ten inches.

As soon as the first frost has hardened the ground, a covering of reeds is put on about four inches in thickness and the work for the winter is over other than seeing that the water drains off properly. In early spring comes an anxious time for the grower as if the weather is mild top growth starts in and part of the covering of reeds has to be taken off and if a hard freeze then sets in there is a jump in the prices of Hyacinths at once. After danger of frost is over the reeds are removed and the bulbs begin to make rapid growth, coming into bloom in April. The flowers are allowed to open and show color and are then cut off, the beds are being constantly gone over to keep the weeds under control and also note any sick bulbs or those that are especially vigorous in growth which can be used for propagating purposes. Harvesting commences about first part of July and is done by hand, the bulbs being thrown into the side trenches gathered into baskets and carried to the drying sheds there the roots and tops are cut off and the bulbs put on racks to dry, the sheds being built with movable wooden screens which allow a free circulation of air or can be closed if weather is inclement.

As soon as the bulbs are thoroughly dry they are gone over again by hand and the outer skin rubbed off, leaving the bulbs in condition which they are usually received in this country. The time required for harvesting and curing takes about six to eight weeks so that the bulbs are usually ready to ship about the second week of August. After the Hyacinths have been harvested the ground is trenched again but no manure applied and it is then ready for Tulips or Narcissus, no ground being used twice in succession for the same bulb.

The method of culture for Tulips and Narcissus varies little from that used for Hyacinths, the Tulip being more hardy there is not so much danger of freezing in spring, the critical time being along in June when the bulbs are ripening, then if it becomes very hot the foliage is liable to turn yellow and die down which makes the bulb ripen prematurely, and affects the blooming qualities the next season. After the bulbs have been harvested the ground is given another application of manure and planted with potatoes again and after they have been harvested it is trenched to a depth of about four feet, the top soil being turned

completely under and the subsoil brought to the top. This is done to eliminate any disease that may have shown itself and is, I am told, an effectual remedy.

The propagation of the bulbs is an important and interesting subject both for the horticulturist and the botanist; and the history of the mode in which these plants are reproduced, is perhaps the most delightful phase of their life history.

They may be multiplied by seed, but this is for the most part a long and tedious process, and usually only employed in the case of raising hybrids. Too many years elapse before the blub is mature enough for flowering, and the patience of the cultivator becomes, consequently, exhausted. The Hyacinth, for instance, demands a youthful immature career of some five or six years before it can feel energy and power, and ripeness enough to throw up a flowering spike, and when considering that this bulb, if found worthy to be grown on, requires twelve to fifteen or twenty years of careful artificial propagation before a moderate stock can be had, it is therefore necessary for some other method to be used in increasing the stock. The method of propagating the Hyacinth used to consist of making two or three cuts across the base of the bulb, after removal from the ground. When placed on the shelf to dry, it was not long before numbers of tiny young bulbs are formed at the margin of each slit. This, however, did not give the desired number of offsets and a new method has been discerned which is in general use. As soon as dug, the bulbs are taken and the base scooped out so that a large bowl-like cavity is formed, lined with the transverse surfaces of the fleshy scales. The bulbs are then put out in the field and covered with sand and left there for fourteen days (this heals the bulb up where it has been cut) after which they are taken into a shed and spread on a rack. After several days it will be found that at the surfaces of the scales inside the cavity have formed a large number of young bulbs of very small size, representing so many individual plants. These are allowed to remain there until the tissues of the parent bulb have all dried out and are then detached and sown out in the open ground. It will take six years to grow a full sized Hyacinth from such a bulblet. In following this method of propagation the Dutch have only utilized the well-known fact that when a plant or part of a plant is wounded in any part of its tissues, it immediately sets to work

Narcissus Paper White Grandiflora growing in Scilly Islands for the English cut flower market.

to heal the wound which has been made; and this is effected by renewed growth on the part of the tissues immediately adjoining the injured part, so as eventually to cover over the wound by a protective callus. If an incision be made in a detached leaf of a Begonia lying on damp soil or sand, an entire new plant or plants will be formed at the margin of the incision. This same power is possessed by bulbous plants. In the first named slicing method of Hyacinth propagation, it is the stem which is chiefly affected, hence we see here a case of adventitious budding from the stem of the same nature as the phenomenon of multiplication by means of cuttings. In the second-named method, however, that of "scooping" it is the scales, equivalent to ordinary foliage leaves, which are affected, and hence we find the same phenomenon of the production of new individuals from the leaf as in the begonia, for the tiny bulblets are formed all round the cut edges on the scales.

Tulips and Narcissus are propagated from offsets which form at the base of the parent bulb, the strongest bulbs being grown on in order to raise these offsets and are called "mother bulbs."

These mother bulbs in the case of the Tulip are planted separate and will produce the following season eight or nine bulbs or bulblets according to how prolific a variety it is. The mother bulb itself disappears as the Tulip is like the Gladiolus inasmuch as the bulb that produces the flower dies and a new bulb forms in its place, all that is left of the old bulb being the dry scales. Bulbs received are here usually in their 3rd year. The Narcissus is also propagated from offsets but the old bulb does not die as in the case of the Tulip altho' it will sometimes break up into offsets altogether and in this way become lost.

Outdoor planting of Dutch bulbs in this country is increasing every year and they certainly deserve to be more liberally planted still. In the early days of spring, as soon as the snow has left us, the first flowers to appear are such as the Snowdrop, the Crocus and the Scilla. These are followed in succession by Tulips, Hyacinths and Narcissi and remind us that winter has really ended and that the season is at hand when we may assist nature in beautifying our home grounds, parks, cemeteries and public gardens.

Where beds are to be solidly planted with spring flowering bulbs, the soil should be well prepared in the first place. A rich,

sandy loam is undoubtedly preferable, but perhaps the most essential part of all is that the beds have perfect drainage, so that there will be no danger of water standing during the winter, to rot or weaken many of the bulbs. The soil should, if not naturally sandy, have a good coating of sand and should be dug to a depth of at least fifteen inches. Well rotted cow manure is the best fertilizer that can be used, but a liberal sprinkling of fine ground bone will also be beneficial. The beds are better if raised a few inches higher than the surrounding ground. The depth at which bulbs should be planted depends mainly on the variety but a simple method is to put the bulbs down at least twice their own depth. After the first hard frost and before severe freezing weather sets in a mulching of from six to eight inches of coarse litter or leaves, covered with some fir or pine branches to prevent scattering by the winter winds, should be put over the beds. This will prevent the alternate freezing and thawing of the ground. This mulching should be removed on the appearance of spring. It is better to take it partially off at first, thus leaving a light protection until the plants appear above ground. In the hardy border, and who does not have an old-fashioned hardy border, bulbs may be planted to great advantage in patches among the hardy plants. They will not only look well and make the border look showy from earliest spring, but they have a thorough chance of ripening the bulbs and need not be disturbed from year to year for this purpose. I would recommend especially the late flowering class of Tulips such as Gesneriana, Bouton d'Or and the Darwin class.

There is another plan of planting spring flowering bulbs, which, to the lover of natural effect, is perhaps the most pleasing. This is planting in the lawn or semi-wild sod land. In many places no better effect can be gained than from large patches of Narcissus above the green sward. In a closely kept lawn only such small and early flowering varieties as Crocuses and Scillas may be planted, but what can be more pleasing in a semi-wild place than patches of the different Narcissus and in shady places the Crythroniums, Trilliums, etc. When this style of planting is adopted each variety or color should be in large patches, if space will permit, the larger the better. Nature always plants in this way.

For planting outside or in I would always recommend the use of named Hyacinths and only single varieties.

Exhibit of Dutch growers at Sassenheim, Holland, May, 1901. (This and the (6) following illustrations furnished by Mr. A. Henderson of Vaughn's Seed Store, Chicago.)

Field of Von Sion Narcissus growing at Haarlem, Holland.

Exhibit of Dutch Growers, Sassenheim, May, 1907.

For the best list of named Hyacinths I cannot do better than give the list published recently in one of the trade papers:

Charles Dickens, beautiful pink, fine formed large spike, one of the finest pink Hyacinths.

General Pelissier, brilliant carmine, compact spike, very early.

Gertrude, rosy pink, compact spike and large bulb. Being of erect habit, it is excellent for bedding.

Gigantea, fine blush pink, large compact spike. The name indicates its character, as it has a giant spike.

Roi des Belges is one of the finest scarlet Hyacinths; keeps its color longer than any other scarlet.

Lord Macauley, deep carmine pink with white eye, the brightest of the dark reds. Extra large and compact spike, a splendid Hyacinth.

Moreno, extra fine pink, very large spike and bells.

Baroness Van Thyll, pure white, large compact spike.

British Queen, pure white, grand spike.

Grandeur a Merveille, a fine blush white, very large spike.

La Grandesse, extra fine snow-white, large spike, and fine formed bells, grand flower. This is an exhibition variety which has no equal along the single white Hyacinths.

Mme. Van der Hoop, pure white, extra large bells. Very fine bedder on account of its erect habit.

Baron Van Thyll, dark bright blue, large compact spike.

Charles Dickens, dark porcelain blue.

Grand Lilas, extra fine porcelain blue, grand large spike and bells. One of the finest light blue Hyacinths.

Grand Maitre, deep porcelain blue, broad large spike and very large bulb, a grand variety.

King of the Blues, deep glossy blue, large compact spike, the finest dark blue Hyacinth in cultivation.

Lord Derby, light porcelain blue, one of the finest light blue Hyacinths, broad spike.

Queen of the Blues, light blue with silvery appearance, extra fine large spike, splendid flower.

The following are among what I would consider the best Early Tulips for bedding,—Artus, scarlet with yellow base; Belle Alliance, scarlet; Chrysolora, yellow; Duchess of Parma, red border with yellow; Cottage Maid, rose pink shaded on white; Keizerkroon, red with yellow border; La Reine, white; Joost

Von Vondel, white; Pottebakker, scarlet, white and yellow; Proserpine, carmine rose; Vermillion Brilliant, scarlet; Thomas Moore, orange; Prince of Austria, orange scarlet; Of the doubles Crown d'Or, and Imperator Rubrorn, sacrlet; Tournesol, red and yellow. In addition to the foregoing we must not forget the late flowering class which are thought by many to be the finest Tulips of all, they certainly are being more freely planted as their merits become better known, but there is still room for improvement. The following are among the best,—Gesneriana, Spatulata, major scarlet with bluish black base; Bouton d'Or, or Ida, yellow; Isabella or Shandon Bells, rose; Sweet Nancy, Golden Crown, yellow streaked red; Picotee or Maiden's Blush, white margined rose; Bizards, Bybloems, odd and interesting varieties.

I must also say an especial word for the Darwins, these I consider the finest of the late flowering class. Their stems are long and stiff, often two and one-half feet high in good garden soil, once planted in a favorable location they will come up each year for four or five years. Of these the named sorts are still rather expensive but the following can be had at reasonable prices and are certainly worth growing.

Glow, Gretchen, Salmon King, White Queen, Clara Butt.

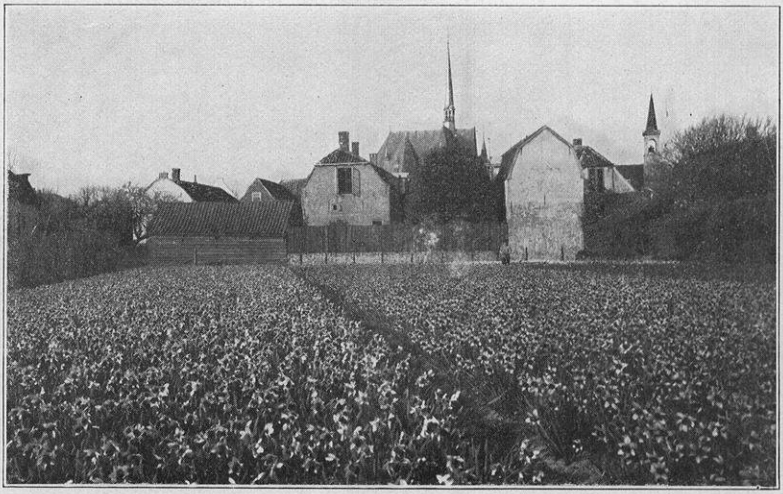
Parrot Tulips are also to be mentioned in the late flowering class of Tulips and while some objection may be raised on account of the stem being too weak to hold the flower erect, still their peculiarly toothed petals and brilliant combinations in colorings make a welcome addition to the late spring flowers.

List of Narcissus for bedding,—Yellow Trumpets—Glory of Leyden, Emperor, Henry Irving, Golden Spur, Bicolor Trumpets, Victoria, Empress, White Trumpets—Mme. DeGraff. Incomparabilis section—Sir Watkin. Double Orange Phoenix did remarkably well with us last season at Western Springs. Single Varieties, Poeticus probably the best and most satisfactory of all Narcissus for outdoor planting.

DISCUSSION.

A Member: I would like to ask if there is anything to prevent burning the leaves of tulips in June?

Mr. Henderson: That is something that occurs only in Hol-



Field of Narcissus Empress, Sassenheim, Holland.

A clump of peonies on the border of a lawn. Madison, Wis.

land, it does not hurt the flowering of the bulbs; the sun is not strong enough to hurt them here.

Mrs. Treleven: How long do you let a bed stay without taking up the bulbs?

Mr. Henderson: The ordinary early flowering I take up the bulbs every year, small bulbs and plant them separate. I know where they have been growing from year to year, but I never found where the early flowering did well, but in some soils the late flowering class will live ten years. The Darwin tulips have been known to have been in one place for ten years.

Mrs. Barnes: You say "plant them again;" at what time would you plant them, as stated in your paper?

Mr. Henderson: No, I would plant them at the same time that you plant them when you get your bulbs, from October 15 on; in digging them in the spring, wait till the leaves go down that is, if you can let the bed stand that way. The great trouble is, in order to do that, you keep your bed unsightly right into June. That is why most people give up trying to save their bulbs, fortunately for us, otherwise we would not be in business.

The President: We have a great exhibit of flowers here, and I presume a great many people are anxious to know about their premiums; I will call upon Secretary Cranefield to read at this time the premium report.

REPORT OF COMMITTEE ON AWARDS.

Your committees having examined all exhibits report the following awards.

	1st.	2nd.
Display Branching Asters	Eben Rexford,	Mrs. Barnes
Display Dwarf Asters	Mrs. D. D. Howlett,	John Uecke
Display Asters (all kinds)	Mrs. Barnes,	Eben Rexford
Single Dahlias	Mrs. Barnes,	Mrs. D. D. Howlett
Double Dahlias	Eben Rexford,	Mrs. Barnes
Cactus Dahlias	Mrs. Barnes,	John Uecke
Herbaceous Perennials	Mrs. Barnes,	—— ——

	1st.	2nd.
Perennial Phlox	Eben Rexford,	Mrs. Barnes
Gladiolus	M. Crawford,	John Uecke
Pansies	Mrs. Barnes,	W. S. Hager
Stocks	Mrs. Barnes	—— ——
Sweet Peas	Mrs. Barnes,	Eben Rexford
Single Petunias	Mrs. Barnes,	Mrs. D. D. Howlett
Double Petunias	Mrs. Barnes,	—— ——
Verbenas	Mrs. Barnes,	Mrs. D. D. Howlett
Cosmos	Mrs. Howlett,	Mrs. H. Asmus
Annual Garden Flowers	Mrs. Barnes,	John Uecke
Boquet Garden Flowers	Mrs. Barnes,	Mrs. Howlett

Potted Plants.

Rex Begonia	Mrs. H. Williams,	—— ——
Any other Begonia	Mrs. E. L. Torey,	Mrs. E. L. Torey
Sword Fern	Mrs. Geo. Jones,	Mrs. E. L. Torey
Any other Fern	Eben Rexford,	Mrs. E. L. Torey
Asparagus Plumosus	Mrs. L. H. McCloud,	—— ——
Coleus	Mrs. E. L. Torey,	—— ——
Sweepstakes potted Plants	Eben Rexford,	—— ——

Wild Flowers.

Golden Rod	E. S. Hildemann,	Mrs. N. A. Durkee
Asters	Mrs. Howlett,	—— ——
Ornamental Wild Fruits	Mrs. Howlett	—— ——
Boquet Wild Flowers	Mrs. H. Palmer,	Mrs. Howlett
Native Fungi	Ray Anson,	Rex Bauman
Collection Wild Flowers	Mrs. Howlett,	—— ——
Sweepstakes on all exhibits	Mrs. Barnes,	—— ——

Apples.

Duchess	W. S. Hager,	E. S. Hildeman
Yellow Transparent	W. S. Hager,	E. S. Hildeman
Whitney	—— ——	Hager
Anisim	Wm. Laird,	W. S. Hager

	1st.	2nd.
Red Astrachan	John Uecke,	Wm. Toole
McMathan	Toole,	Alex. Laird
Wolf River	Toole,	Alex. Laird
Lubsk Queen	Toole,	—— ——
Wealthy	Toole,	—— ——
Yellow Sweet	A. D. Brown,	—— ——
Lowland Raspberry	A. D. Brown,	—— ——
Saxonian	A. D. Brown,	—— ——
Plumb Cider	Laird,	—— ——
Peerless	Laird,	—— ——
Longfield	Laird,	—— ——
Utter Red	Laird,	—— ——
Fameuse	Laird,	—— ——
Pewaukee	Laird,	—— ——
Iowa Beauty	—— ——,	—— ——
N. W. Greening	Laird,	—— ——
Switzer	Hildemann,	—— ——
Barloff	Hildemann,	—— ——
Snyder	Hildemann,	—— ——
Beautiful Arcade	Hildemann,	—— ——

Honorable Mention.

Specimens Wis. Sandcherry.....Irving Smith
Most Excellent Exhibit potted plants not competing. Eben Rexford
Exhibit Gladiolus not competing.....M. Crawford
Exhibit Bermuda Onions.....A. I. Smith

AL. HENDERSON,
AXEL JOHNSON,
Committee on Flowers.

DR. T. E. LOOPE,
Committee on Fruits.

Dr. Loope: Before you close I would like to say a few words. I have been very much gratified at the attendance; I never saw anything like it anywhere in the State, and I think we would better come back to Shiocton again next year. (Applause.) Now, there was something brought in by some gentlemen,—I want you to understand that this is not a balloon, nor a foot ball, it is not a tulip nor a narcissus, or any of those things, nor a sweet potato, but that it is just a common sort of an onion, that is what it smells like, but what I wish to say particularly, these gentlemen are truthful people, there are two of them and they show two kinds of onions, but they are truthful men and they come up here and tell me that they can grow a thousand bushels of those on an acre and they can sell them for a dollar and a half a bushel,—$1,500. Now you know they tell the truth, but what I particularly was anxious to say was that in this Shiocton enterprise I believe you had better put in 100 acres, that would be $150,000. (Laughter)

"BILLS."

W. S. HAGER.

The Secretary asked me to give a talk on bills. He did not say what kind of bills, good bills, or bad bills, bills payable or bills receivable, due bills or bank bills, bills of divorce or legislative bills. But I rather incline toward the theory that he meant the latter. At least I think that that kind was strongly impressed on his mind during the session of the legislature. At a meeting of the Executive Committee last winter it was decided to ask the legislature to increase the annual appropriation of this Society from $4,500 to $8,000 and I was asked to introduce such a bill which I did, February 1st, when it was read and referred to Committee on Agriculture.

March 2. Committee recommended for passage.

Yours truly was a member of that committee, perhaps that helped some.

March 4, ordered engrossed and read third time.

March 6, engrossed and referred to Committee on Third Reading.

March 7, reported correct.

March 12, referred to Committee on Claims where it lay without a hearing until about June 1st, when we got a short hearing.

About all they seemed to care to know was "What are you going to do with the money?"

June 7, reported for passage.

June 11, ordered engrossed and read third time.

June 12, reported correct and referred to Committee on Third Reading.

June 14, laid over until June 18th. June 18th passed the Assembly and sent to the Senate next day.

But why weary you with its wanderings in the Senate. Suffice to say that in due course it also passed the Senate and was signed by Governor Davidson, thus making it a law and that hereafter this Society will annually receive from the treasury of the State of Wisconsin the sum of eight thousand dollars, a certain part of which must be used for experimental work.

I have told you nothing of the hitches, hindrances or tangles that we had to avoid or get out of as best we could for many were petty and all are now safely passed. But, I want to say right here now, that those who have never undertaken to get an appropriation through can scarcely appreciate the anxiety that it will give from the time of introduction until it is safely a signed law with the Secretary of State.

Furthermore, I hardly think we could have gotten it through at all if it were not for the efforts put forth by the members of the society in urging its passage upon their members of the legislature.

We also had another Bill relative to the publishing of our reports in monthly installments which ran the ordinary course until like Poor Dog Tray it got into bad company and was finally decapitated in the Executive office, the reason for which would take me too long to tell and the telling of which I am afraid without doubt would be uninteresting to you.

FORCING BULBS AND BULBS ADAPTED TO HOUSE CULTURE.

MR. EBEN REXFORD, Shiocton.

The winter forcing of bulbs is a phase of floriculture rapidly on the increase among the lovers of flowers, and I am always glad to "speak a good word" for the practice, because the attempt almost always results satisfactorily. If proper care is given potted bulbs there need be but few failures.

At the head of the list of desirable bulbs for forcing I would place L. *Harrisii,* sometimes catalogued as Bermuda Lily, but most commonly known as the Easter Lily, because it is grown so extensively for Easter decoration. This is a most noble flower when well grown, exquisite in its white purity and delightful in its fragrance. If care is taken to secure the best quality of bulbs, and they are given the right kind of treatment, few plants will fail to bloom well in the living-room. The smaller bulbs may give but one or two flowers, but they will be as perfect as those from larger bulbs. I would advise, however, the purchase of large-sized bulbs, as a plant having six, or eight, or ten blossoms is always vastly more effective for decorative purposes than the smaller ones, and it is no more trouble to grow it.

If flowers are wanted for Easter, bulbs should be procured and potted in September or October. It takes about six months to bring a plant into bloom under such conditions as ordinarily prevail in the average living-room. The ideal soil for this plant —and for nearly all bulbous plants, for that matter—is one made up of about equal parts garden loam and old, well-rotted cow-manure, with a generous amount of coarse sand worked in to insure friability. My method of planting this Lily is this: I first put into the pot about an inch of broken crockery or something similar, for drainage. Over this I place a layer of sphagnum moss to prevent the soil from washing down and closing the crevices in the drainage material. Then I put in about four inches of soil. Into this I press the bulbs, using to each pot as many as will cover the surface of the soil. This will take about four of the ordinary size to an eight or nine-inch pot. It does

not matter if they touch each other. Then I water them well, and put the pots away in a cool dark place to remain until the roots are formed. They are left there until top-growth begins, no matter how long that may be. As a general thing, however, it will be in six or seven weeks. When brought to the light, and the stalk begins to stretch up, I fill in about it with soil, and keep on doing this, as the stalk elongates until the pot is full to within an inch of its rim. This method of low potting is practiced because this, like all other Lilies, has two sets of roots, one from the base of the bulb, and another from its stalk, immediately above the bulb. By putting the bulb low in the pot we provided soil for both sets of roots to develop in, which would not be the case if the bulbs were planted near the surface.

Next to the Bermuda Lily in desirability as a winter-bloomer I would place the Narcissus, that flower

"which comes before the swallows dare,
And takes the winds of March with beauty."

We have very few flowers, if any, richer in color than such varieties as Trumpet Major, Van Scion, Empress and Horsfeldii, all in cloth of gold, or gold and creamy white, and Poeticus, or Poet's Narcissus, pure white with crimson bordered cup. These, with Paper White, a standard old sort, for forcing, enable us to brighten the windows of our homes in winter with the best representatives of a large family of plants which has enjoyed almost as much popularity as the Rose. If I were obliged to choose but one from the list mentioned, I think I would decide on Van Sion, but I would much dislike to go without the others, for all are royally beautiful, and each variety has some charming peculiarity which the others do not have.

In potting the Narcissus, I make use of seven and eight-inch pots, and crowd as many bulbs into the soil as the pot will accommodate. As a general thing, this will give you eight or nine bulbs to a pot. I find that by massing these, as well as all other bulbs, a much stronger and more satisfactory show of color is secured. One or two bulbs to a pot are good, as far as they go, but the trouble is, they don't go far enough. By the massing method one economizes space, as well as labor in caring for the plants. There are no bad effects resulting from close planting, for a soil prepared as advised above is quite rich enough to fully develop all the flowers from as many bulbs as can be crowded into a

pot. As a general thing, the Narcissus will come into bloom in about six weeks after being brought from cold storage. It will take it from six weeks to two months to form strong roots. During this period it should be left in a dark, cool place, to which it should be taken immediately after potting.

Third on the list of bulbs for winter forcing I would place the Hyacinth. The most satisfactory variety, all things considered, is the Roman. This for several reason: It is of the easiest culture, being almost sure to bloom. Each bulb will send up several flowerstalks, while the Holland varieties seldom have more than one to a bulb. Its flowers are loosely arranged along its stalks, therefore much more graceful in appearance than those of the ordinary kind. Because of this it is excellent for cutting. To secure the most satisfactory effect with it, I put as many as twelve or fifteen bulbs in earthen pans about six inches deep and fourteen inches across. This gives an almost solid mass of flowers and foliage. A pan of Roman Hyacinths in full bloom is very effective for decoration of the church or home. One does not fully appreciate the possibilities of this plant until he has grown it in the manner described. Florists offer us the Romans in white, blue, pink, and yellow, but the white sorts are the only ones I would recommend, as the colors of the others are dingy, and have a faded-out look anything but pleasing.

Holland Hyacinths are easily forced. I much prefer the single kinds for the reason that their flowers look less prim and formal than the double ones, which are so thickly crowded along the stalk that all individuality is lost, a spike being just about as ornamental as some of the fearfully and wonderfully made ribbon flowers are that we see displayed in the windows of a ladies' furnishing store. This, however, is simply a matter of taste. Somebody must admire this class more than I do, for the florists force them in large quantities each season, and seem to find ready sale for them.

I have never been very successful in forcing Tulips. The early single ones bloom fairly well, but the double kinds, and the choicer varieties of the single sorts, seldom develop satisfactorily, buds form but they blight so easily that I have given up trying to grow any but the early single varieties, and these in only small quantities. The amount of care required by them yields far better results when bestowed upon any of the bulbs of which mention has already been made.

In potting Hyacinths, Narcissus, and Tulips, I simply press the bulbs down into the soil well, leaving the upper portion of them uncovered. It is always advisable to procure bulbs early in the season,—in September, if possible—and to pot them as soon as received. If some are potted at intervals of ten days or two weeks, a succession may be had which will pretty nearly cover the entire winter. Those not potted immediately should be well wrapped in paper and stored in a dark, cool place until needed. This to prevent the evaporation of the moisture stored in their scales. A bulb long exposed to light and air soon becomes flabby and wilted, and not much can be expected of it after this condition sets in.

Many persons are under the impression that it is not necessary to put potted bulbs away in a place that is dark and cool for a time after potting. But this is one of the important items to be considered. A bulb so treated will form roots without making much, if any growth of top, this latter stage of development being largely dependent on warmth and light. Unless a bulb has strong roots it lacks ability to supply the top with sufficient nourishment to bring about proper development. If we place a potted bulb in the window immediately after potting it, the influence of warmth and light stimulates it to attempt top-growth before roots have formed, or while they are forming, and the result is almost always disastrous. A period of several weeks in a place where the temperature is low, and from which all light is excluded, is one of the chief essentials of success. Very little water will be required during this period. It is well to examine your bulbs occasionally, however, and give more water if the soil seems to be getting pretty dry, but on no account give enough to make, —and keep—the soil wet. Always leave your bulbs in cold storage until they show that they are ready for active work by beginning to show a growth of leaves. Then take them to the light, but do not encourage rapid development by subjecting them to too much heat. A room where the temperature is 60 or 65° is much better for them than a warmer one. Much heat makes their growth weak, and their flowers will be short-lived.

The Amaryllis is a favorite, when grown successfully, and certainly it deserves popularity, for choice varieties of it are magnificent in form and coloring. But judging from the many complaints which come to me it disappoints the grower oftener than

it rewards his or her efforts to grow it satisfactorily. I think most failures result from an imperfect knowledge of the habits of the plant. Most persons give it about the same amount of water the year round, and thus prevent it from taking the resting-spell which it must have between each period of growth in order to do its work well. If you study the plant carefully, you will discover that it produces leaves freely for a time, and then ceases to grow. By and by there will be another production of leaves, followed by another period of inactivity. A continuous supply of water prevents the plant from becoming fully dormant between each growing period, and this is just what causes the mischief. By withholding water as soon as new leaves cease to appear, and allowing the soil to become almost dry, the plant apparently stands still for a time, but it is really preparing itself for the next growing period. Keep it in this seemingly dormant condition until new leaves,—or possibly a bud—appears. Sometimes the first indications of renewed activity will be a flower-stalk sent up from one side of the bulb, outside the last leaves produced. Then—and not till then—apply water, and make liberal use of some good fertilizer. Encourage a strong and vigorous growth by generous treatment, but, as soon as leaf-production ceases again withhold water, and let the plant rest until such a time as it shows a disposition to resume growth. By making these alternating periods of rest and growth as complete as possible in themselves, we may be reasonably certain of securing two or three crops of flowers each year from this extremely beautiful and interesting plant. Give it the same kind of soil I have advised for the other bulbs spoken of, arrange for perfect drainage, and disturb its roots as little as possible. It is very sensitive to root-disturbance, often refusing to bloom for months after repotting. If a good liquid fertilizer is used, it will not be necessary to repot oftener than once in two or three years. Remove the little bulblets or offsets which form about the old bulbs as soon as they appear, thus throwing all the strength of the plant into the three or four bulbs which a seven or eight-inch pot will accommodate comfortably.

Vallotta *purpurea*, sometimes known as the Scarborough Lily, is a fall-flowering variety of the Amaryllis, which the lover of really fine flowers cannot afford to be without. It increases rapidly, and a pot of it will soon have a dozen or more bulbs of

flowering size. In August or September, these bulbs will throw up flower-stalks about a foot in height, each bearing from three to five flowers of a rich vermillion. They are not as large as those of the hybrid Amaryllis, but they are brighter in color, and quite as perfect in shape, and, because of their greater quantity of flowers, they are really more useful for general decorative purposes in their season. Unlike the varieties of Amaryllis first mentioned,—which do not take kindly to the cellar—this can be stored there from November to March or April with entire safety.

The Agapanthus, Calla, Imantophyllum, and Tuberose,—all very desirable plants for amateur culture,—are generally classed in among the bulbs because their flowers resemble those of the bulb family in many respects, but neither of the four have bulbous roots. Their roots are of a fleshy, half-tuberous character. The Agapanthus has foliage something like that of the Amaryllis, though longer and narrower. It sends up a flower-stalk three or four feet tall, in summer. Its flowers are lily-shaped, each about two inches in length, of a very dainty and rare shade of blue. These flowers are borne in clusters of fifty, sixty or more, all radiating from a common center, so that a plant in full bloom seems to bear one great globular flower. The effect is very striking, and a strong plant, with several flower-stalks, is always sure to be greatly admired. It is of the easiest culture. Give it a soil of graden loam mixed with rotten manure from the cowyard, plenty of water during its growing season—which is from April to August—and store it in the cellar in November, leaving it there until March, and it will ask little else at your hands. It will live on for an indefinite period, increasing in profusion of flowers with age, and needing only an occasional shifting to a larger pot. For some reason unexplainable we seldom find it growing in home collections of plants, but it deserves a place there.

The Calla is a plant everybody admires, and almost every window garden contains a specimen of it, good, bad, and indifferent in condition, but the complaint is quite general that leaves are more plentiful than flowers. I am inclined to think that in most instances this comes about because its owner keeps it growing, or attempting to grow, the whole year round. We have very few plants that will do well under such treatment. They must

have a resting-spell sometimes during the year. This is in accord with the law of nature, and we cannot expect the plants in the window to flourish if we ignore it. If the Calla is put out of doors in June and left there until September turned down on its side, it will lose all its leaves, and one would quite naturally think it must be dead. But an examination of its thick root will soon convince you to the contrary. Repot it in a soil composed of equal parts of loam, muck, or other soil rich in vegetable matter, and old manure, give it water liberally, and in a short time it will send up great healthy leaves such as you never see on a plant kept growing the year round, and it will give you fine flowers at intervals during the season. The Calla is a very accommodating plant, and often blooms well in winter after having been kept growing all summer, if liberally supplied with liquid fertilizer. Many persons treat the plant as if it were an aquatic, and keep its roots standing in water, but I have never seen good flowers from a plant so treated. Some labor under the belief that in order to secure flowers hot water must be applied, but so far as my observation goes, the use of hot water is not only unnecessary, but positively harmful.

The Imantophyllum, or Clivia, is a plant seldom found in the collections of amateurs, but it has claims to consideration which many of the plants usually found there do not have. It bears a striking resemblance to Vallatta *purpurea* in every respect except that of the size and color of its flowers. These are nearly as large as those of the ordinary Amaryllis, and their color is a tawny red, or red showing a hint of orange. This plant, like the Agarpanthus and Vallotta, can be wintered in the cellar, though, if kept up, it often gives a crop of winter flowers.

The tuberose would have more friends than it has at present if it were hardy enough to withstand early frosts when planted in the garden. Few persons, comparatively, undertake to grow it there, because of its tenderness, therefore its merits are not generally understood. But we of the north, where frosts come early, can effect a compromise with nature in the culture of this really lovely flower, by growing it in pots. So grown, it will be found one of the most useful of fall flowering plants for the decoration of the green house and dwelling. Put two or three roots of it in seven inch pots of rich, sandy soil, in June or July, keep them well supplied with water during the summer, giving them the

full benefit of a sunny exposure, and along about September they will send up flower-stalks which will often reach a height of four feet. In October and November two feet of the upper portion of each stalk will be thickly set with a large number of white flowers with waxlike petals, resembling in texture those of the Cape Jasmine or Magnolia. The Tuberose has a fragrance as rich and heavy as that of either of these two flowers. Some persons find it overpowering. Those who have never grown this plant for flowering in the home will find it excellently well adapted to amateur culture, and a most desirable addition to the comparatively small list of plants that bloom close to the edge of winter.

DISCUSSION.

Mrs. Howlett: Would it be necessary to dry the calla out completely to have it bloom well, or would it be better to have it grow, take care of itself, shift for itself in the garden during the summer months and not dry out completely as if turned on the sod?

Mr. Rexford: I do not know if it is necessary, but I find it saves a great deal of labor and it comes out so strongly if you pot it in rich soil, that seems to answer fully the requirements of the plant.

LILIES.

JOHN TIPLADY, Lake Geneva.

My subject for our information today is the "Lily," esteemed as Flora's emblem of purity yet lacking the popularity it rightly deserves, caused probably by the erroneous idea that lilies are very expensive and not entirely hardy in Wisconsin. Or it may be because lilies are largely grown in greenhouses in great quantities each year that our thoughts have been diverted from the true possibilities of the family collectively as garden flowers.

Lilies as a rule are not expensive, the standard varieties being within the reach of all who possess a patch of garden or shrub plantation and their hardiness cannot be doubted because some of the varieties listed in the catalogs such as Superbum (the Turk's cap), Tigrinum (the tiger lily) Canadense and Philadelphicum are native to our northern states.

That liles were well known floral subjects to our ancestors for hundreds of generations is evidenced by the fact that the bible in speaking of their beauty says that "Solomon in all his glory was not arrayed like one of these." And how long has Solomon been dead? That lilies grew and were admired long before Solomon's time cannot be denied, consequently they are historic, and their origin dates back to the Garden of Eden for all we know. Back to remote antiquity to say the least. The particular variety mentioned in the bible I am led to believe was L. Candidum (often called "Annunciation or Madonna Lily") known to have been under cultivation in Europe in 1596. This variety seems to be the best adapted to the amateur or new beginner to force in the window or greenhouse about which I will speak later on. For beauty and ease of cultivation our native varieties as previously mentioned are worthly of consideration. Superbum of the swamps and Canadense of the fertile meadows "toil not neither do they spin" yet in their season are subjects of great beauty. The varied forms make it possible to select a variety suitable for almost any location as far as height is concerned. They may be graded from L. Concolor, scarcely two feet high, to the noble Himalayan lily which when estatblished grows from 10 to 14 feet high bearing long tubular flowers of white streaked inside with purple and whilst all are beautiful anywhere they may be made doubly so when planted in masses or colonies among shrubs or herbaceous perennials. Especially are they most effective when planted thinly among Paeonias, the one succeeding the other in their blooming period and both seeming to enjoy the benefits derived from each other. A well prepared bed of this combination would stand undisturbed for years and would be admired by all who had the good fortune to see it. Whereas we can boast of a few very beautiful varieties indigenous to the northern states, the more highly colored and ornamental kinds such as Auratum and Speciosum and their varieties come from Japan. L. Harrisii (the true Eastern lily) is grown

A border of hardy shrubs.

largely in the Bermudas and is exported to us in large quantities for forcing purposes. So universal was this variety grown by florists for the Easter trade that the demand exceeded the possible supply and its propagation was rushed indiscriminately and to such an extent that disease attacked them and today it is a rare treat to see a good specimen of this famous variety. New kinds continue to appear, however, the last to my knowledge being L. Philipensis and L. Satchuense. If the following remarks as to outdoor culture are closely adhered to there will be little chance of failure.

The soil most suited to lilies is a deep garden loam, well pulverized and enriched with well rotted manure, should it be heavy in texture add sufficient sharp sand to lighten it up and the drainage should compare favorably with good corn land. Nothing will injure them so readily as water standing about them. In planting it is a good plan to place a handful of sand around each bulb to keep it from rotting and as October is the best time to plant, now (August) is the time to make your selections as to variety and prepare the ground, which should be thoroughly done as the bulbs do best if left undisturbed for five or six years after which time they should be lifted and divided and transplanted again in beds prepared as before. Fresh or artificial manures should be avoided. Beneficial results may be obtained by mulching during hot dry weather in summer as well as in winter and the flowers should be picked off as fast as they begin to fade as the formation of seeds tends to exhaust the bulbs. In planting they should be set from 3 to 6 inches deep according to size, the larger ones will stand deeper planting and the bulbs should not be allowed to lay around out of the ground as drying greatly weakens them. This is often the first cause of partial failure with imported stock, because they become dry in transit and most of their vitality is lost. Accept nothing but strong healthy bulbs when buying and the chance of failure will be diminished. For a beginner at out-door culture I would suggest the following kinds along with our native varieties; Auratum, Candidum, Elegans, Martagon, Speciosum and Tigrinum. After becoming proficient in the cultivation of these varieties, the following kinds may gradually be added to the collection, viz.: Umbellatum, Croceum, Pardalinum, Tenuifolium, Wallace and Longiflorum. The last named variety is the one used so extensively

by florists for forcing and is perhaps the least hardy of the above list. However, with ample protection on well drained ground it may be safely carried over winter and in the blooming season will amply repay the extra trouble taken. Thousands of cases of bulbs of this pure white lily are annually put into cold storage to retard their growth and are purchased by florists who keep up a succession of lily blooms nearly every month in the year. With regard to forcing I shall confine my remarks as much as possible to the method most suitable to ameteurs rather than professional florists with an object to the cultivation of the lily in the window or small greenhouse. Upon receipt of the bulbs (which is usually about the first week in September) they should at once be placed singly in well drained 5 or 6 inch pots containing a rich compost of loam and well rotted manure. The tips of the bulbs should be just below the surface. Then place the pots close together in some shady spot on a foundation of sand or ashes to insure perfect drainage and give them a thorough watering. Sprinkle on top of the pots a thin coat of sand after which cover the whole with about 4 or 5 inches of light soil and no more attention is required unless very severe weather sets in when an additional covering of leaves or litter completes the job. Under the above conditions the bulbs should make plenty of roots (an essential feature to forcing) and by December 1st, they may be transferred to a shady window or under a green house bench. As soon as top growth commences, however, they should be given full sunlight. Fumigation with tobacco stems or an occasional syringing with soapsuds will keep them clear of green aphis and the plants will continue to thrive under ordinary conditions. Six weeks are usually required to bring the plants into full bloom from the time the buds are visible which should be about the middle of March. Bulbs thus forced are of no further value and it is a waste of time and energy to attempt to make any future use of them. Shiploads of these bulbs are annually imported from Japan and it is not unusual to hear of a single florist establishment forcing 40,000 bulbs each season.

DISCUSSION.

Mrs. Howlett: I would like to ask if any of these gigantic Himalayan lilies 12 to 14 feet high are raised in this country?

Mr. Tiplady: Yes, the Himalayan Lily, Lilian Giganteum has been known to exceed fourteen feet in Rochester, New York.

Mr. Loewe: I would like to have Mr. Tiplady give us a list of bulbs, with special reference to hardiness.

Mr. Tiplady: With special reference to hardiness, I would exempt from my paper Lilian Longiflorum, the variety used to take the place of the L. Harrissii for Easter; outside of that I believe the varieties mentioned in my paper will stand.

Mr. Toole: Among the varieties mentioned were L. Auratum and its varieties, that is, I understood that. What do you mean by its varieties?

Mr. Tiplady: There are three varieties of Auratum, all of which you may see carried in the leading florists' papers; it will pay you to look them up.

Mr. Toole: Can we count on the Candidum as being reasonably hardy, with care?

Mr. Tiplady: Yes, above all others Candidum suffers the least. It is a sacred name, has a sacred meaning, and it is perfectly hardy all over, as far as I know, all over the northern states of the United States, L. Candidum is specially recommended as hardy and satisfactory to the amateur as well as to the professional, and it is grown by the thousand. Another good thing about L. Candidum is that you may place several varieties in a pot and depend upon it that they will all bloom at the same time. It is strictly hardy outdoors; you do not even need to cover it with ashes. I trust you know the meaning of the word hardy.

Mrs. Barnes: May I ask a question about roses. I would like to know if the green aphis on the rose bushes at this time of year injures them, and if so, what will prevent it?

Mr. Tiplady: There is no doubt about green aphis injuring anything, they have never been known to do any good on flowers. It is easily eradicated; if you have water power, squirt it, and if you have not, use soap suds every washing day. Make a kerosene emulsion and that will kill the aphis. There is no use put-

ting tobacco on an aphis, because he won't eat it; you have got to put something onto an aphis that will penetrate his body and kill it. Kerosene emulsion will do it.

Mrs. Barnes: Bordeaux mixture?

Mr. Tiplady: No, Bordeaux mixture is a fungicide, you have to treat the aphis with an insecticide.

The President: Ivory soap suds is as good as kerosene emulsion.

Mr. Moore: I do not want a wrong impression to go out in regard to tobacco killing aphis, it will kill aphis; not by the aphis eating the tobacco, but steep some tobacco stems in water and then apply the water to the plant, it is a most efficient remedy. Another thing, you can buy at almost any florists' house decoctions of tobacco, those can be mixed at the rate given on the can and spread on the insect and it is certain death. Tobacco is positively the greatest insecticide for aphis that is used in the greenhouse, and it will work just as well out of doors.

Mr. Hager: I want to emphasize what the last gentleman said about tobacco; when everything else failed I used tobacco; take stems and steep them to get a strong solution, and whether they eat them or not, they die. You can get the tobacco stems at any tobacco dealer, they give them away.

Mr. Rexford: The florists sell extract of nicotine.

Mr. Moore: We use it in our greenhouse, we have the tobacco stems but we think the other is quicker and easier; we have a little atomizer that costs us a dollar; we use that for every kind of plant that has aphis on it.

Mr. Henderson: In using the nicotine preparation, ordinary nicotine preparation that is on the market today contains 40 per cent, it only runs 25, but a drop of it on a child's tongue will kill the child, and when you have used it, put it away carefully. Recently on Mr. Washburne's place a small boy took a bottle and tasted it and died, so if it will kill human life, it will certainly kill the bugs.

Mrs. Howlett: Would not kerosene emulsion or soap suds be better than the nicotine anyway, on account of its being a fertilizer to the rose bushes?

Mr. Moore: Unless you know how to make kerosene emulsion you run a great many chances of killing the plants.

The President: Use the soap suds.

Mr. Henderson: Ivory soap makes a good solution, and it will do the work for an amateur.

The Secretary: The members of the Executive Committee will perhaps recall that at the session at Green Bay last evening you recommended an amendment to the constitution,—I am speaking to the members of the State Horticultural Society, that is a little matter of business that must come up at this time and be disposed of. It was recommended that Article 3 of the Constitution be amended to read as follows:

Article III. Its members shall consist of annual members paying an annual fee of *fifty cents* excepting that paid members of local societies may become members on payment of an annual fee of twenty-five cents, of life members paying a fee of five dollars. Wives of such members shall be entitled to the privileges of full membership; of honorary annual members who may by vote be invited to participate in the proceedings of the society and honorary life members who shall be distinguished for merit in horticulture and kindred sciences or who shall confer any particular benefit upon the society.

A motion by Mr. Smith, that the amendment as read be adopted, was carried.

EVENING SESSION.

NATIVE WISCONSIN PLANTS BEARING BULBS AND TUBERS.

PROF. R. H. DENNISTON, University of Wisconsin.

A careful study of the herbaria and lists of Wisconsin native plants at our disposal shows a total of fifty-two species which have either bulbs or tuberous roots. Of these over one-half the number are found in four plant families; the Liliaceae or Lily family comes first in the list with ten species, followed by the

Orchidaceae with nine, the Cyperaceae, or sedges, with five, and the Compositeae with four. The remaining twenty-four species are distributed in thirteen plant families, with not more than three in any one family.

Prabably the Lily family is the one best known to gardeners as a producer of bulbs. It is to this family that the tulips and hyacinths belong. Of the native plants in this order there are the Alliums, the leek, wild onion, and garlic, plants of unsavory odor and bad reputation with dairymen; the yellow and white adder's-tongue, or dog-tooth violet, the camassia or wild hyacinth, and the wild orange and wild yellow lily, plants that give a touch of bright color to meadow and woodland in mid-summer.

Nearly related to the Lily family is the Amaryllis family, and although this is so well known to horticulturists through the narcissus, amaryllis and tube-rose, I could find but one representative among our native plants, and that, the humble little Hypoxis, or yellow stargrass which grows from a solid bulb or corm.

The orchids are all of them more or less rare and little known; they are found in low bogs, and seven of the species in this list spring from corms. Among them are two species of Microstylis commonly known as the white and the green adders-mouth; two species of Liparis or twayblade, the putty-root or Adam-and-Eve, and the grass pink. The Arethusa has a bulbous root and the Pogonia, a cluster of tubers.

In the Araceae, the Jack-in-the-pulpit is one of our commonest types, and most of us are familiar with the turnip-shaped corm from which it grows. In the same family is the less-known dragon-root, with clustered corms.

The Cyperaceae, or sedges, are plants of the lowlands, and a few of them reproduce by corms or tubers. Cyperus esculentus, or yellow nut-grass, often becomes a troublesome weed in cultivated grounds.

In the Leguminosae or pea family, there are two Wisconsin plants which have tuberous roots. Psoralea esculenta, prairie-apple or Indian bread-root, has a tuberous, turnip-shaped root, and was formerly used for food by the Indians of the Northwest. Apios tuberosa, or ground nut, bears edible tubers one or two inches in length, on underground shoots. Three tuber-bearing plants are found in the Compositae, the Jerusalem artichoke, one of the sun-flowers. Helianthus tuberosus, is often

cultivated for its edible tuberous roots. Other Composites are the tuberous Indian plantain, Cacalia, tuberosa, and the white lettuce, Prenanthes alba, which latter bears a bitter tuberous root.

In this list of tuberous and bulbous plants it is rather difficult in some cases to decide whether or not a plant shall be included. We find such expressions in the botanies as tuberous root-stalk, and rhizmatous tuber, which show that one form merges into the other. I have omitted such doubtful cases.

The list of plants follows, with scientific and common names, classified according to plant families.

Ranunculaceae.

Anemone caroliniana—Carolina Anemone—bulb. Anemonella Thalictroides—Rue Anemone—clustered tubers.

Ranunculus bulbosus—Bulbous buttercup—bulb.

Fumariaceae.

Dicentra cucularia—Dutchman's breeches—bulbs. Dicentra Canadensis—Squirrel corn—grain-like tubers.

Cruciferae.

Dentaria laciniata—Cut-leaved toothwort—tuber. Cardamine rhemboidea—Bulbous cress—tubers. Cardamine purpurea—Purple cress—tubers.

Malvaceae.

Callirrhoe triangulata—Poppy mallow—tuber.

Geraniaceae.

Oxalis violacea—Violet wood sorrel—scaly bulb.

Leguminosae.

Psoralea esculenta—Prairie apple—tuber. Apios tuberosa Ground nut—tuber.

Umbelliferae.

Eulophus Americana—Eastern eulophus—fascicled tubers Erigenia bulbosa—Harbinger of spring—tuber.

Compositae.

Helianthus tuberosus—Jerusalem artichoke—tuber. Cacalia tuberosa—Tuberous Indian plantain—tuber. Prenanthes racemosa—Smooth white lettuce—tuber. Prenanthes alba White lettuce—tuber.

Labiatae.

Lycopus Virginicus—Bugle weed—tuber. Scutellaria parvula—Small skullcap—tuber.

Portulaccaceae.

Claytonia Virginica—Spring beauty—tuber. Claytonia Caroliniana—Carolina spring beauty—tuber.

Amaryllidaceae.

Hypoxis erecta—Star grass—corm.

Araceae.

Arisaema triphyllum—Jack-in-the-pulpit—corm. Arisaema Dracontium—Dragon root—clustered corms.

Alismaceae.

Alisma Plantago—Water plantain—corm. Sagittaria variabilis—Broad-leaved arrowhead—tuber.

Orchidaceae.

Microstylis monophyllos—White adder's mouth—corm. Microstylis Ophioglossoides—Green adder's mouth—corm. Liparis lilifolia—Large twayblade—corm. Liparis Loeselii—Loesel's twayblade—corm. Calypso borealis—Calypso—corm. Aplectrum hiemale—Adam-and-Eve, or putty root—corm. Arethusa bulbosa—Arethusa—bulb. Calopogon pulchellus—Grass pink—corm. Pogonia pendula—Nodding pogonia—clustered tubers.

Liliaceae.

Allium Schoenoprasum—Chives—bulb. Allium cernuum—Nodding wild onion—bulb. Allium Canadense—Meadow garlic—bulb. Allium tricoccum—Wild leek—bulb. Erythronium Americanum—Yellow adder's tongue—corm Erythronium albidum—White adder's tongue—corm. Camassia Fraseri—Wild hyacinth—bulb. Lilium Philadelphicum—Red lily—bulb. Lilium Canadense—Wild yellow lily—bulb. Zygadenus elegans—Smooth zygadenus—bulb.

Cyperaceae.

Cyperus Schweinitzii—clustered corm. Cyperus esculentus—Yellow nut grass—tubers. Cyperus strigosus—Straw colored Cyperus—corm. Cyperus rotundus—Nut grass—corm. Cyperus dentatus—Toothed Cyperus—tuber.

Equisetaceae.

Equisetum arvense—tuber.

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

WINTER MEETING.

ANNUAL CONVENTION MADISON, FEBRUARY 4, 5, 6, 1908.

SMALL FRUIT SESSION.

WEDNESDAY MORNING, FEB. 5th.

STRAWBERRY REVIEW FOR 1906-7.

GEO. J. KELLOGG.

CULTURE, VARIETIES, VARIETIES FOR MARKET, VARIETIES FOR HOME USE AND THE OUTLOOK FOR 1908.

This is an old subject but always new.

Culture.—To be successful the field or garden spot should be prepared two years before hand. A one year clover sod should be well manured and grow a magnificient crop of potatoes the year before planting to strawberries. After the potatoes are off the ground should be plowed early in the fall, then again just as it freezes up. Leave it as rough as possible for good

ploughing; don't do as the sailor did, his oxen would not keep the furrow. "Well," he said "go where you have a mind to, its all got to be ploughed." The late ploughing is to kill the white grub. If there are many grubs do not plant it to strawberries. One year clover stubble is not apt to have the grub. Do not plant strawberries on new forest or old pasture until cropped two years. Plow again in the spring early to conserve the moisture. Then the day before planting disk it well and harrrow smooth, mark 2 by 4 feet, have your plants ready and a boy to open the holes with a spade and a man on his knees with a pan of plants in an inch of water. This is the best machine to plant strawberries. A tobacco planter may do if the ground, team and weather are just right. As soon as planted start the weeder or twelve tooth cultivator, go over the whole planting every week and after every rain as long as he weeds grow and with the hoe keep out every weed in the row. The last cultivation and hoeing should be done in November just before it freezes up. If you have never hoed in November you will be surprised to find the many weeds that live over winter. Four sprayings with bordeaux, two before bloom and two after fruitage will insure healthy foliage and freedom from insects. The hedge row system will give the largest fancy berries but not as many bushels of fruit as the matted row two feet wide with the plants four inches apart from each other. The first runners are the best bearers.

Varieties.—If I could have but one kind it might be Aroma, Bederwood, Brandywine, Clyde, Glen Mary, Jessie, Klondike, Lovett, Marshall, Parson's Beauty, Splendid or Senator Dunlap; either one of these is good money for anybody, they are all perfect in blossom and if only one kind it must be perfect.

New Varieties.—Don't plant them unless you have money to burn.

Varieties for Market.—If only one, Aroma; if two Dunlap and Warfield; for long distance shipments, Brandywine and Enhance; for fancy trade, Glen Mary, Klondike, Jessie, Marshall and Sample.

For home use are fourteen I have named; but if I could have but one it would be Aroma, Bederwood, Jessie, Marshall or Brandywine, but I cannot get along with one. I want one for early, one for late, one for bushels, one for size and one for

quality. No one kind has all these good points. Try the new ones lightly.*

Crop outlook for 1908.—If you do your best for the bed on 1907 and they come through the winter without injury and we have just the right weather we will have a bumper crop; then if Michigan gets bad frosts and the south get cut off from a crop Wisconsin berries will pay big money. But let everybody else have a big crop. There it is, the man who has the best fruit and knows how to market it is the man that will rake in the greenbacks.

DISCUSSION.

Dr. Loope: As to the varieties, just think of that list that he read! I never saw one-tenth part of them in my life. I grow the Senator Dunlap and the Warfield and I have had other kinds, but I have not had any particular use for the former, they do not give me very many berries, and I have got down to those two kinds, and the more Warfield in them the better crop I get, and I find the Warfield cannot stand up with the Senator Dunlap when it comes to running, and if you do not take great care you get them mixed up and get a great many more Dunlap than you do Warfield, and you do not get so many berries.

Mr. E. A. Richardson: I wish to state in addition to what Mr. Kellogg said about varieties, that we raised the August Luther in Sparta for early. Some use the Bederwood and have very good success with it, but the coming early berry with us is the August Luther. It is a very attractive berry and a very good bearer and a fairly good shipper. Of course the later berries get a little small. It is something on the order of the Michel's Early, but a larger berry and a firmer and better shipper. Every nurseryman or seedsman is putting out new varieties every year and it has been said here before that unless we have money to burn, we ought not to use them all, but I think it is a good plan for us to be trying a few every year. There is nothing that is quite so fascinating in horticulture as the propogation of

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*If I had room I would plant this season to try Fendall, Highland, Helen Gould, Oswego, Saratoga, Great Scott, St. Louis, Pine Apple, Repeater, Almo, Early Hathaway, Good Luck, Chesapeake, Cardinal and Kittie Rice and the big Dutchman, 4 to a quart.

new plants. I find it so with me, and it is really a joy and a very great source of pleasure for me to take the seed of strawberries and watch the new plants develop. We are all amateurs generally in that line, in Wisconsin, yet I think that every strawberry grower can find it to his profit to work along those lines. I have at present about three acres of a variety that I have tried seven years that I raised from the seed, and I thought I had something pretty good, but I concluded that it is not what we want. It is very late, it comes into bearing about the same season as the Enhance, it is a better shaped berry generally than the Enhance, with the exception of the first ones. It is also like the Enhance in that it has the green tip, but when it is ripe it is very black, when it is half ripe it is red clear through, but it is pretty late and it is inclined to be rough, so that I think I shall discard it. I got last year almost three hundred cases to the acre off the plant; that is one feature that made me hang to it longer than I should, that was the fact that it would give me quite a number of berries in the latter part of September and October. Even this year, late as our season was, we had quite a few berries on it, and later I should judge almost one quarter of a crop, of an ordinary crop, that would not get ripe at all, that was frosted. We had plenty of berries that were the size of a good sized hickory nut and the frost came and destroyed them. The methods of cultivation I think have been pretty well set forth by our friend, Mr. Kellogg and I do not think I need to add anything to that.

STRAWBERRY NOTES FOR 1907.

C. L. RICHARDSON, Chippewa Falls.

The summer of 1907 was marked by a decrease in the area planted to strawberries throughout our section. This was due partly to the extension of other lines of industry, partly to a succession of short crops and partly to causes purely local. Most fields formed very slender rows the preceding year. Add to this a cold late spring and the reason for the shortage is clearly apparent.

While our rows were thin, the individual plants therein were larger than usual and produced an abundant crop of large, highly colored berries. Southern shipments were light, only fair in quality and expensive. As the result prices were higher than at any time during the last ten years with the possible exception of 1906. Our entire crop netted us $1.31 per case.

Our first berries were sold June 27, the latest the season has ever opened, as against June 18, 1908 and a ten year average of June 17. Our season closed July 20 as against July 10, 1906 and a ten year average of July 11. The season lasted 23 days as against 22 in 1906 and a ten year average of 24 days.

Our good crop of berries was largely, I believe, the result of a top-dressing of solid well-rotted manure that was applied to the new set bed in August, 1906. This was put on at a rate of about a ton to sixty rods of row. Then a two horse corn cultivator was run over the field twice and regular cultivation continued.

Part of this field was mulched during the fall, part in winter and part not until after the blossoms had fallen the following spring. The winter had not been severe, snow covered the ground and no difference due to early or late mulching was discernible. The rows unmulched until spring were Warfield and Dunlap, the Glen Mary, Kittie Rice and Climax need winter mulch.

When August, 1907 arrived we hired a manure spreader and applied old compact stable manure at the rate of 3,000 pounds to senventy rods of snow. A spreader is better than hand work; it tears the manure into smaller shreds, spreads it more evenly and is capable of more exact regulation.

Three years ago, we began in a small way to mulch with manure. It seemed to produce good results, both in berries and weeds, so this year we have mulched about half of our field in this manner, most of the remainder with straw and a small portion is unmulched. As the first of the winter was snowless and the ground froze and thawed during January we anticipate some injury to the unmulched portion. This part we hope to cultivate next spring until after the fruit is set and then mulch heavily with straw. The part now mulched with manure we shall try to cultivate and then mulch between the rows.

I believe there is a distinct advantage in top dressing. The fertilizer is applied not long before the time when the crop is

forming; it is appled to berry growth rather than plant growth and it is the berry not the plant that is sold. If the soil be poor and the plants unthrifty a top dressing in July or August is a wonderful stimulant.

Our plants did not grow well during the latter part of the season, due I have since decided to the hardening of the ground at a depth of three or four inches below the line of cultivation. This is a common occurrence where cultivation is shallow or insufficient. A fine tooth cultivator is all right for smoothing the surface and retaining the dust mulch, but something heavier is needed to tear up and loosen the ground to a greater depth.

We have not tested any new varieties the past year and have now gotten down to the bed rock of fourteen varieties out of perhaps one hundred and fifty that we have tried. These are the Dunlap, Warfield, Bederwood, Haverland, Johnson's Early, Marshall, Challenge, Sample, Marie, Glen Mary, Lady Garrison, Vories, Midnight and Nettie and a seedling of our own that proves to be a valuable commercial variety. The Lady Garrison and Vories we shall discard.

It will be observed that there is not an extra early variety in the list. We have tried a good many and none are satisfactory. They are small in size, soon run down smaller and none are of even average productiveness. The old Michel's Early was about as good as any. August, Luther and Camerons Early are the earliest we have ever grown. Excelsior was the most satisfactory, but after the second picking the crew dubbed them "the buckshot" and complained so vigorously at having to pick them that we have discarded this variety also. Johnson's Early is not an early at all, but a midseason variety; a wonderful plantmaker, firm and a good pollenizer, but the appearance of the fruit is not sufficiently attractive. For early and medium the leaders are Warfield, Dunlap, Haverland and Bederwood, while the Sample, Challenge, Marie and Midnight are very late. The former is a shy bearer and pink in color like the Hunn. Midnight is a good pollenizer but utterly unreliable. For the commercial grower a dozen varieties is none too many and he needs a dozen more in a small way to see if any of the new ones are valuable to him. Experiments are mighty expensive diversions but they are the only means of learning certain vital facts.

The smaller the organism the more susceptible it is to slight variations of environment. So for such a small plant as the

strawberry it is difficult or impossible outside the ranks of a few widely disseminated varieties to name those suited to the field or garden of another. The list we now carry is the result of fifteen years of experimentation, though we shall replace the Lyon and perhaps others and take on a number of experiments.

It appears that around Chippewa Falls, the acreage in strawberries has been again reduced. Fields as a rule are thin and many vacancies appear along the rows. The spring was too late, the summer too cold, the late fall and winter too dry, and not enough snow fell. With such a combination of conditions plants will be scarce, high priced and of unknown quality, while strawberries will be scarce next summer. If the growers will market carefully, export intelligently, band together and keep their nerve, prices will again be remunerative.

C. L. PEARSON, Baraboo.

The strawberry acreage at Baraboo is not as large as formerly. Those who grow strawberries by the acre may be counted upon the fingers of one hand. Some who were in the business are now growing cucumbers for Heinz, others are producing sugar beets for the Madison factory and still others will grow sweet corn for the local canning company while a few persist in *"raising cane."* So the berry grower finds less competition and a better local market.

We grow big strawberries at Baraboo which may perhaps be accounted for by the fact of our near proximity to Ringling Bros. elephant barns from which we secure fertilizer.

The strawberry crop and the length of the season were both abbreviated by the cool wet weather. There was a lively demand for the fruit in the local market even if it did require more sugar than usual.

I have nothing new in methods of culture but will emphasize the desirability of the check row system of planting so that these may be cultivated both ways with a horse, during the forepart of the growing season.

As to new varieties I haven't much to offer except more experience. Two years ago I ordered a bunch of the new kinds and perhaps because distance lends enchantment I sent to the

state of Connecticut for them. The plants came and were given good attention but they did not appear to enjoy their Wisconsin environments. They got homesick and wrapped their blankets around them and laid down to pleasant dreams. In other words they passed in their checks. I had already passed my check to Connecticut and now they have the money and I have the experience. There was one variety that survived and that is Uncle Jim. I have high hopes of him and want to hear from others about this new variety.

If I wanted about fifty of the best varieties for home use or market I take Dunlap, Warfield, B. Wood and Sample or Aroma. Take these five and multiply them by ten and you will have a better plantation than you would by a multiplicity of names.

H. C. MELCHER, Oconomowoc.

When all conditions are ideal the growing of strawberries is a pleasant and profitable occupation and we think we come as near the ideal as any place in Wisconsin.

The four principal factors in a profitable crop of strawberries are, a suitable soil, a good market, good transportation facilities, and a good man at the other end of the line to do the selling. This is a combination that can be realized by but few strawberry growing sections of our state. Our soil is a rather heavy clay and after being in the business for twenty-four years have yet to see the first crop failure or anything that would be considered poorer than a three-quarter crop. When it comes to marketing the crop we must really be considered as a suburb of Milwaukee, the first strawberry market in the state, for our transportation facilities are such that in but little more than one hour after leaving us they are in the hands of the commission man. The crop of 1907 will always be remembered as one of the most profitable ever raised. In quantity it was not the equal of some previous crops, but the price received was exceptionally good, starting in at $2.75 per 16 quart crate and never getting below $1.50, with the average somewhere around $2.00.

It costs us about 70c to put a case on the Milwaukee market after growing them, this leaves $1.30 per case to the grower for raising the crop, which every one must concede is a good thing.

After hearing such a report as this I imagine all of you would like to come to Oconomowoc and engage in the strawberry business, but I warn you that this is the report of but a single year, and that if we take the period of the last ten years we would have to cut this profit in half and if we went back five years further than that we would have to reduce it still more, for we have had years in which the price received would not equal the cost of marketing, to say nothing of the cost of producing the crop.

We have no shippers' association or organization of any kind. Each grower acts independently and perhaps 95% of the berries raised is sold by the much abused commission man and strange to say we are perfectly satisfied.

By the time we are ready to market our berries Michigan is the only competitor and as we can put our crop on the market in so much better condition this competition is little feared. Any one who notices the daily quotations of the Milwaukee berry market will see that Oconomowoc and Dousman berries are especially quoted and are from 30 to 50c above Michigan berries.

Nearly all of the standard varieties are grown in our locality but no combination is complete without Warfield and Dunlap. Our growers are all progressive enough to try the most promising of the new kinds and no two would agree on the same list. In my own case after having tried over sixty varieties I have narrowed down to four for commercial purposes, viz.: Warfield, Dunlap, Brandywine and Gandy, the least reliable of these being Brandywine.

When pistillate varieties are planted if they can be properly mated so that they can be picked together I prefer to have each alternate row staminate as that will insure fewer imperfect berries.

The matted row system is the only one practiced here. Heavy plant makers are planted four feet by two, shy plant makers somewhat closer.

Plants have gone into winter quarters in the best of shape and we are looking forward to a good crop for 1908.

DISCUSSION.

Prof. Taft: So far as the prospects in Michigan are concerned I will say, everything looks very well so far as the stand is concerned, but owing to the loss of the peach orchards there was a very large planting of strawberries, and that may and we hope will give us a large crop, at the same time it may tend somewhat to reduce the prices. We are growing much the same kinds as have been mentioned, the Dunlap perhaps there being most generally successful. There was mention made of the "Uncle Jim," but our friend need not have gone clear across to the Atlantic shore to get plants. It is a Michigan plant. I have been growing and watching it for ten or twelve years. It seems to do well under almost all conditions with us and is regarded generally as very valuable on our soil. You may find it in some catalogues as the "Dornan." It was sent out originally as "Uncle Jim," but it was shown at our State Society and was then named the "Dornan" for the originator, so that we have both names in the catalogues. Another variety that does well is the Pride of Michigan. This requires rather better care than the Dornan, but those who have grown it for the market think it is a very profitable sort. The Dornan I might say, while it responds to good care, will do better than most other kinds of its class under partial neglect, and perhaps for the average grower and under average conditions it would be better than the Pride of Michigan.

Mr. Hey: We are not among the largest growers, but we endeavor to grow quality and at present have about two acres of strawberries. We practice the double hedge row system. I have heard a great many people talk about the hedge row system, but when we saw their patches it was more what we called the matted row, but we practice the real hedge row system. We had some killed, however, I do not know what it was, but quite a number of our mother plants died for some reason or other and the young plants that were set were weak and a great many of them died also. Some of the berry growers down there complain of the root aphis, although that might have been the cause of those plants dying, I did not determine what the trouble was. It has been our experience with the Dunlap that it always fails to make a big crop. We are experimenting with the Little Cham-

pion, the Pride of Michigan and the New Home, and a few others we have already experimented with, but we do not find anything that really can take the place of our old tried sorts, that is, the Bederwood, Warfield and Splendid. The Splendid originated in our country down there and we think a great deal of it. We had good prices last year and expect good prices this year as a great many have quit the business.

Dr. Loope: I would like to ask Prof. Taft about that root aphis.

Prof. Taft: It has been troublesome in some sections, particularly in sandy soils and in dry seasons, but I have seen little of it in Michigan. For the last two or three years we have had quite abundant rains and as a result largely, I think, we have not had any serious trouble from that. We have had what has been spoken of as the "black root," and the plants behave about as described by the last gentleman. The stand apparently is all right for the first month or two and then the mother plants will commence to wilt and gradually die and this takes place perhaps before the runners have established themselves, so that we have oftentimes a break a number of feet in length, several plants will be missing and examining them you will find that the ends of the roots have become black and died back. This, I think, is quite unlike what they have in the Eastern States where it is of a fungous nature. It was examined by a number of experts and they were of the opinion that it was of a fungous or bacterial nature. While I could not be positive that it may not be anything in the soil, yet I am not inclined to that opinion. We find it is mostly troublesome where we have replanted within perhaps two years and where the soil is not in the best condition, where it is perhaps lacking in humus, and we are planning to make use of lime on the soils before putting out the plants, and hope, if the cause is as I have indicated, that we will be able to correct the difficulty which has been quite troublesome in some places; perhaps from the fact that the plants taken from those diseased fields, if I may use the words, and placed on other soils, have not shown the disease, I am not inclined to think it is anything contagious.

Mr. Kellogg: Do you not think it is due to winter killing?

Prof. Taft: No, because it is quite serious the first year that it is put out, we find the plants in bad shape by August, and if the weather remains dry, they get much worse by the time the

ground freezes. Two years ago I saw a large number of patches where the injury was quite serious, but I took occasion to go to other places where the plants were taken from exactly the same fields and I could find no sign whatever of the trouble, so I do not think it is of a contagious nature.

A Member: What is your theory in regard to putting on lime?

Prof. Taft: I am inclined to think there is something in the soil which seems to be counteracted in that way, and I think, being of an acid character, the lime will remove the difficulty.

Mr. Smith: I would like to ask Prof. Taft regarding the use of lime, if that same condition may occur in soil which has to all appearances an abundance of lime in it? We have been working on soil which is on an old lake, plain soil, when we go down to subsoil, there are thousands of little shells which of course at present are nothing but lime, and yet this condition exists. The water is hard, as hard as any water can be, which of course indicates lime. Will lime do any good on that soil?

Prof. Taft: I do not attempt to give this as a specific, I only said we are trying to see what it would do, hence I can not answer the question, but my impression is that it would be better to have a caustic lime, better than old shells. I do not think it is so much the actual lack of lime in the soil as it is that we want something there to counteract this acid which seems to be present.

Mr. Smith: What is the cause of the acid in the soil, an old soil?

Prof Taft: Well, I do not know what it is, I do not mean to say it is acid, and I am merely trying this to see if it will counteract the acidity. On the other hand, acidity may be due to the fact that there has been a large amount of green crop turned under, that might cause it. Oftentimes we find soils are acid where they have been worked for many years and humus taken entirely out of it, a soil then becomes acid. I have seen particularly in the Eastern States large areas of sandy loams where you could not grow clover and other crops and yet by the addition of perhaps half a ton of lime you could grow them to perfection and those soils are much like those I have seen most troubled from this disease. One thing that made me think it might be helped by the lime was, I had the pleasure a few days ago of listening to a lecture by a gentleman from the Bureau of Soils in Washington and he had a large number of specimens

and photographs of plants that they had grown, using cultures from unproductive soils, and those roots in every case looked exactly as these troubled roots I spoke of and he had other photographs and specimens of plants grown where they had used lime and they seemed entirely free from this difficulty. Those plants which he had which were affected had the ends of the roots blackened as though they had been burned off almost and by merely the addition of a thousand pounds or so of lime, per acre he had changed things so that they grew a crop in apparently perfect health.

Mr. M. S. Kellogg: I would like to ask our friend from Lookout Farm as to whether he considers that the Warfield is a better yielder than the Dunlap? I have never seen a variety that will out-yield the Dunlap, with us at least.

Dr. Loope: We have been growing the Dunlap four or five years and the Warfield alongside of it and the Dunlap raises a good, fair berry; it promises, as has been said, very great things in the spring, when it is in blossom, but you cannot get the berries that you can from the Warfield, not in my section anyway, and I believe that in all that section of the country you will find the same conditions. It may not be so in Janesville. We have a good strong soil, but there are not the berries on it, there is no use of talking.

Mr. Kellogg: I would like to ask the gentleman from Illinois who spoke about the Dunlap promising so well and failing, do you attribute that to any soil conditions, or perhaps to the fact that the plants may be too thick?

Mr. Hey: We hardly know what to attribute it to. I have heard it said that even staminates need to be fertilized and there was nothing there to help the Dunlap in that case. As far as our plants being too thick is concerned, they were not too thick in 1907, they were rather too thin, and yet I might say one-half to two-thirds of the blossoms failed. While we did have a few fine berries, the crop was not one-half up to the Warfield.

Mr. M. S. Kellogg: I would like to give a little experience of my past season's crop. I took one of our pickers this past season and in thirty minutes' time he and myself in covering probably fifty feet long of two rows of Dunlap that were grown on the matted row system, in thirty minutes we picked thirty-two quarts and that is easily one-third better than we could have

done on any other variety that we have had in the past with probably twenty-five to thirty sorts.

Mr. Wright: The Dunlap last year was a great deal like this gentleman said. I found the first two or three pickings were all nice, large berries, but they did not last. The Warfield and Lovett right alongside lasted ten days after the Dunlap was gone.

Mr. Pearson: I have found that the pistillates will out-yield the staminates, the imperfect will outyield the perfect. I do not suppose they have to expend so much energy in producing the pollen.

Mr. Wright: One thing I will say, some of us have fixed it so that the pickers will not be discriminating among the rows, that is, those that have set with the tobacco planter have planted one kind on one side of the machine, planted Warfield plants on one side and Senator Dunlap or some other variety that we set with on the other side, thus alternating and keeping the plants in the row so that the pickers cannot discriminate against rows, and also if one plant at one time is a better plant maker than the other, it has a tendency to fill the row all the way through more or less. We like that plan fairly well.

Mr. Smith: I wish to add here one remark regarding the Dunlap. We have had pretty good success with it. It is with us, I might say, still in the experimental stage, that means that we have not had it over four or five years, but it has done very well, we are very much pleased with it.

Mr. Moyle: In regard to this Dunlap matter you have been discussing, I think if you will investigate it carefully, the matter can be explained. You will find the Dunlap is a great plant maker. It has a tendency to make plants and it will throw out a little runner, stick it into the ground, the plant will hardly form before it throws out another runner and will start another plant and keep going and will form dozens of little plants and these plants, after the plant has taken root, immediately begin to form flower buds in the crown. The Dunlap is a variety that does that, it will go on making more plants and these flower buds are not as strong as they should be. The result is, when the plant blossoms in the spring, you will have a mass of Dunlap plants all over the ground and when these blossoms push up, a great many of them are too weak and immature, and that is the reason why when the Dunlap blooms, the first blossoms are the most

vigorous and they fertilize and set and form berries and the last ones are too weak and sickly and are like the lower berries on a bunch of currants. I think that explains it.

Mr. M. S. Kellogg: I will say that for several years past we have been sending Dunlap plants into the central and southern portion of the state of Illinois, not only in five thousand but twenty-five thousand lots to single growers and they are setting out these plants in their fields. They are men who have been in the business for twenty-five to thirty years, and if the Dunlap did not return them something for their labor, they would try something else.

Mr. Hanchett: I do not like to see the Dunlap trampled upon, I am glad Mr. Kellogg has stood up so faithfully for it. I have my first planting of Dunlap yet. I got my plants from Mr. Moyle some years ago and we picked our fourth crop off that Dunlap plat last season and we got one hundred cases as the crop of a quarter of an acre. It is the best crop we have raised on a quarter of an acre, and that same plat is in good condition for next year. There is one feature of the Dunlap, it will produce successive crops more than any other variety. You must be careful about getting it matted too closely. If you have fruited it and you wish to renew it for another year, why, go to work and cultivate and you will find it in fine shape next year.

Mr. Davis: I would like to know if anyone has had any experience in raising the Bubach? There are several growers west of Oshkosh that are raising it. I think it is one of the best, if not the best, for yield and quality of fruit that we have. There is but one crank that I know of that is raising the Dunlap with any success at all.

Mr. Roessler: We are down in the southern part of the state and we have raised the Bubach. It is the largest berry we have grown, but it is not a good market berry, and we have discarded it, and that has been the experience with most of our neighbors.

Mr. E. A. Richardson: The Bubach is a large, highly colored, beautiful berry and it is all right if you are near the market.

The President: We have had very good success with the Bubach. Usually it is a heavy yielder and a good market berry.

Mr. Davis: It is a home berry, it will not do to ship. We have found it is really the best berry for the home market and it is easier to take care of than any other berry that we have,

because the rows are narrow. It does not set as many plants as you need, but I think that if you look at it in one way, that it saves a great deal of time in thinning out as we have to do in the Dunlap and Warfield.

Mr. Pearson: I have grown Bubach for twenty years and whenever I want to get a box of fancy berries to give away I go to the Bubach. It is a fine berry, especially for the home market, it is not a good shipper.

Mr. Moyle: If you have a good strong soil and can get good plants to start with, the Bubach is a berry that will pay and it is a berry that will bring a fancy price on the Milwaukee and Chicago markets and you can get it in at the top price, but as stated, it has a weak plant. There is another berry that will take the place of it, that is the Bismark. It resembles the Bubach in every respect, only the berry is a little better and I think if the gentleman will try that, if he has not tested it, he will find he has a better berry than the Bubach.

Mr. Smith: I would like to ask a question regarding the Nick Ohmer. We got one beautiful crop, the finest crop of strawberries I ever saw and that was perhaps fifteen rods of the Nick Ohmer, and then failed, and I have always had a longing to get a Nick Ohmer that will do well.

Mr. M. S. Kellogg: We have tried the Nick Ohmer and we passed it up with several varieties that we have tried as not profitable as a market variety, and not reliable as a home sort.

Mr. Blackman: I have grown the Nick Ohmer, I had two years of splendid results from that, big, nice, fancy berries, and planted it again but I placed it on bottom land, on black soil and it utterly failed there. You have to have the right conditions, right weather and it is magnificent and it produces a good crop in the fall also. I discarded it on account of its being unreliable. When everything is right, it will do extremely well.

Mr. Marshall: I have not heard anything about the Lovett. I think that the Lovett is a pretty good berry, one of the best fertilizers I have.

Mr. Davis: Around Oshkosh the Lovett is grown a great deal as a perfect flower with the Warfield or with the Bubach. It has given very good satisfaction, taken the place of the old Wilson.

Mr. Richardson: I desire to protest in regard to the Bismarck. I have tried it. It is an absolute, utter failure, it is

absolutely worthless. The plant is there, but when the berry season comes the berries are missing from year to year on a sandy loam.

Mr. Roessler: I would like to ask if any one has followed the double hedge row system spoken of by Mr. Hey, besides Mr. Hey, and what their success has been?

Mr. Blackman: I have tried that with the "Uncle Jim," Challenge and the Dunlap. I did not get very good results with it. I put it on very rich ground, but I got some large berries, very large, they grow to perfection, but you do not get so many berries, and I would prefer the half matted row, that is the way I grow mine and get very good results. I tried the hedge row two years and I have abandoned it altogether.

Mr. G. J. Kellogg: I have tried putting plants one right after another in the row eight or ten inches apart. That is a plan of my own, that is not a double hedge row, but I do not like that, I do not like any other plan than the half matted row, keeping the plants four to six inches apart. In regard to thinning Warfield or Dunlap in the row in August and September, if they get too thick, take a steel rake and rake out those runners that are just started and pull them off. Nick Ohmer has been a failure with me. Bubach was a failure once in four years. it was a magnificent berry when it did well.

Mr. Hanchett: In regard to the double hedge row system, I will say I tried it two years. I found the cost of taking care of the plants was about double of what it cost to keep the matted row system. The first trial on a half acre plot of Dunlap kept in the double hedge row system, we got a yield of two hundred cases to the half acre and one hundred and sixty-six of the cases were graded "Fancy" by our Fruit Growers' Association, and the rest were graded "A." In comparison with this, that same season we got a yield of about one hundred and fifty cases to the acre from the matted row system, and we got no "Fancy" from the matted row system from our Association. This would seem to indicate that the double hedge row system was very much superior to the matted row system, but this last year our results were quite different. Our hedge row system plants were badly winter killed and yielded very poorly, while our matted row system yielded very well. I did not keep the exact figures as to our hedge row system; this past season was an experiment

with varieties; we planted all the varieties which we had and a couple of rows of each variety and we found that most of the varieties planted did not respond to the hedge row system. The Dunlap and Warfield responded fairly well, but even in the case of Warfield and Dunlap this last year, they were badly frozen out, and I think that those large plants with many crowns were peculiarly susceptible to winter killing in such winters as we nad a year ago. There was a coating of ice that fell early in the winter which stayed on all winter and I think that that will prove fatal to those large plants with their multiplicity of crowns in most cases.

Mr. Paulson: Is it possible to grow a cover crop on strawberry plants for winter protection?

Mr. Roessler: A neighbor of mine thought that that would be a good idea and he sowed oats between the strawberries along about in August, and he thought he would let that grow and leave it for a cover crop. As far as I could see it was just as bad to have a crop of weeds as those oats. I could not see any difference.

Mr. Richardson: We tried oats as a cover crop one year, and we were not satisfied with the results. They are a lot of trouble, they prevent cultivation late in the fall, they leave the ground in such condition that it freezes and heaves more in the winter than it does where cultivation is continued until late in the fall. It is a better plan to mulch. You can mulch just about as quickly and satisfactorily as you can get the oat crop, and then you have your berries in far better condition.

Mr. G. J. Kellogg: This cover crop with oats is a lazy man's process and yet it is very frequently successful. I have known neighbors down there in Janesville that grew acres and acres of them year after year, and sowed in their oat crop and protected them without any trouble to draw straw.

Mr.. Riegel: Here is a question I would like to put in,—Wanted—Information regarding the Perfection currant, quality, nardiness, crop tendency, compared with the Victoria.

Prof. Taft: I could not say how it would do in Wisconsin, but think if you can succeed with the Wilder, you would like the Perfection. I have been watching it five or six years and have had plants for three years. They are very strong growing and fully as hardy as anything we have and seem to be very productive. The clusters are unusually long and the berries are

rully as large or larger than the Fay, and they have a very pleasant flavor, what might be called a sub-acid currant, and I think it is a very desirable kind, either for home use or market.

Mr. Blackman: I have grown Perfection, it is larger than the Fay. I cannot say as to the productiveness, I think it will equal any.

Mr. Hey: Has any one grown Pomona?

Mr. M. S. Kellogg: We have grown it in a small way, it is not equal to the Wilder in vigor and the size of the berry is a trifle under if anything. It is a good currant but it lacks vigor.

Mr. Ray: I grew the Pomona until I got the Red Cross. The Red Cross is a much better berry.

The President: Has any one had any experience with black currants?

A Member: Black Champion is the best.

Mr. Smith: I do not like to have it go into our volume without a word that we are recommending Fay's currant. Of all the fruit that has been spread about the state of Wisconsin I think the Fay's currant has been the most unqualifiedly worthless of anything that has ever been put out. (Cries of "Hear, Hear.")

Mr. Moyle: You plant the Fay currant on heavy clay soil and give it plenty of fertilization and it is equal to any of them, and I fail to find anything that will grow as large, except the Cherry, as large as the Fay currant. I have the Wilder growing and all these other varieties. They may yield more, but they are not as large in berry. It may not do well on Mr. Smith's nice mellow garden soil at Green Bay, but put it on heavy clay soil and give it hard knocks and you will find it stands all right.

Mr. Toole: A neighbor of mine favors the Fay and has grown many of them and when his are in the market there is a poor show for any other kind.

AFTERNOON SESSION.

WEDNESDAY, FEBRUARY 5.

MAKING MONEY FROM APPLES.

L. R. TAFT, Agricultural College, Mich.

Twenty years ago the people in other States had little faith in the possibilities for growing apples successfully in Wisconsin, but the exhibits that have been made at the Chicago, Buffalo and St. Louis Expositions from this State have very effectually put an end to any doubts regarding its feasibility. It is now recognized that with proper care in the selection of locations and soil, and in choosing varieties adapted to the climate, Wisconsin has some advantages over states that are famed for their production of apples.

As with other States it must be admitted that apples cannot be grown in all sections and under all conditions, and particularly when it comes to the consideration of growing this crop on a commercial scale every precaution should be taken to secure favorable conditions. With a crop whose possibilities per acre are so great it would be the height of folly to attempt its culture until every known requirement had been secured, as the failure to provide the needed natural conditions on the one hand, or to give the required care in all particulars could, even though it might seem of little importance, result in complete failure.

THE SOIL AND LOCATION.

It is true that the apple thrives under quite a wide range of soil, but all things considered it is well to choose either a moderately heavy sandy loam or a light clay loam. While the trees might grow for a few years upon the lighter sandy soils, they would not thrive as well as upon the heavier loams, and in order to get abundant crops of large fruit it will be necessary to furnish the trees with plant food at an annual expense of three to five dollars per acre, which might be saved had a heavier soil

been used. From this it is evident that it will be cheaper to pay a good price for land fairly rich in plant food than to buy a poor or worn out soil on account of its cheapness. The selection of a heavy clay soil or one that contains an excessive amount of organic matter, especially if it is of a mucky nature is for various reasons inadvisable.

Of all the requirements for an orchard perhaps the most important of all is that the soil is well drained. Even when it is possible to remove the surplus water by means of tile drains or open ditches it does not answer as well as when the nature of the soil permits it to soak away naturally. Even though the trees may make a good growth, they are seldom fruitful.

Another important requirement is that the orchard site be somewhat elevated above the surrounding country. Mere elevation alone does not suffice as if upon an elevated plateau the conditions might be little if any more favorable than upon level land at a lower level. If the land is gently rolling and so situated that both the surface water and cold air can be readily drawn off it gives an ideal location for an orchard. In such a location, not only does the elevation lessen the injury from frost, but the resulting air currents often prevent serious losses from the same cause. It is not uncommon to find dead trees in an orchard up to a certain level while in the next row and perhaps only five feet higher little or no injury has been done. And then too it is not uncommon to have a crop ruined by frost on trees where the air cannot move freely, while those located in air current suffer little or no loss. Because wet soils are low and level may account to some extent for the fact that soils that require underdraining are not as well adapted to orcharding as those which are naturally drained.

There are many points of importance to the orchardist such as the preparation of the land, age of trees, distance between the rows, varieties, heights of heads and depth of planting, but they are more or less local in their application and each person must find out what are best adapted to his conditions, and for this reason only those that are general in their nature will be considered in this paper.

PRUNING.

If there is any one thing upon which every one seems to have pronounced views, but in which the practice shows the greatest diversity, it is that of pruning, although it would seem that for a given locality what is best for one would be equally suited to others. On the contrary it is not common to find one man who thinks it is positively injurious and perhaps dangerous to the life of a tree if it is pruned at all, while his neighbor carries the pruning of his trees so far that as they reach maturity there will be only two or three branches with tufts of wiry twigs at the ends. Most orchardists will admit that these extreme methods are not correct, but the trouble is to find the happy medium.

In starting a young tree it is a good plan to remove all but about six of the larger branches, with the idea of cutting away two of these after a year or two. These should be headed back about one-half. Some persons make it a practice to go over the trees at frequent intervals during the first summer, cutting out all surplus shoots that might start and thus not only form the head of the tree into the shape desired, but throw all of the vigor into the permanent branches. Experience, however, shows that this may be a mistake, as although it may be well to cut off any water-sprouts that start below where the head is desired, aad perhaps to try to balance the head if it becomes misshapen, it is not advisable to remove any of the leaf surface, as this will reduce the power of the tree to assimilate food and will not only check the growth of the branches, but what is of more importance will hinder the development of the roots and trunk of the tree, and its ability to obtain food for future growth. In the case of our orchards that have been allowed to grow beyond the reach of a spray pump and especially if, as is often the case, the branches merely have a few tufts of twigs at the ends of long bare poles, it will often result in the renewal of the tree-tops and bring everything within easy reach if the center branches are headed back. Good results can often be secured when they are cut back from one-third to one-half their length and at a point where they are six, or even eight, inches in diameter. This, of course, is very severe pruning and should not be practiced except where necessity compels. By leaving the side branches with but little pruning the check to the trees will be much less than when all the

branches are cut back, as the leaf surfaces will be sufficient to assimilate the plant food and will produce a strong vigorous growth of shoots in the center of the tree. These should be allowed to develop without much thinning out during the first season, but the following spring the surplus branches should be removed.

When trees are headed back in this way it is generally possible to secure an excellent crop of fruit from the lower branches and during the third, or perhaps the second, season after pruning, the center of the tree will begin to produce fruit.

If the condition and development of the lower branches makes it desirable, they also can be headed back at the end of two years, so that within four or five years the trees can be entirely renewed and thus not only enable the trees to produce large crops of fine fruit for many years to come, but bring the branches nearer the ground where they can be readily sprayed and the fruit gathered with much less labor.

TILLAGE VS. MULCH

Whatever the age of the trees, good results cannot be secured unless they have been able to make a reasonable growth and it is only under exceptional conditions that this can be secured when the trees are in sod and are receiving no special attention. For young orchards where the location and nature of the soil make it possible, it is desirable to keep the land cultivated. Various crops can be grown, the production of which will defray to a large extent the expenses of growing the orchard. The use of grain and similar sowed crops is not desirable, at least within four or five feet of the trees, but almost any of the so-called hoed crops which require cultivation from early spring until about the first of August can be used to advantage, although care should be taken not to have any of the hills so close to the trees as to materially interfere with their growth by robbing them of plant food and moisture.

If it is not thought best to grow hoed crops between the trees, fairly good results can be secured when the trees are young if a strip four or five feet wide either side is cultivated. The remainder of the land can be used for hay crops, although clover, alfalfa or some of the legumes will be better.

Where the land is stony or rolling so that the cultivation would not be practical, fairly good results can be secured if an area six feet in diameter about the trees is dug over and hoed occasionally during the summer.

After the trees reach a bearing age they will occupy a greater part of the ground and it is doubtful if the value of crops that can be grown between the rows will equal the increased cost of cultivation, considering the fact also that the growth of the trees will not be as good as if they have the use of the entire land. Whether the soil should be cultivated or not will depend very largely upon its condition and the growth of the trees. If they are growing rapidly, it often becomes advisable to seed the land to clover. A part or all of the crop may be taken off on the one hand, or it may be cut and allowed to remain on the land to provide humus and plant food, depending upon the condition of the soil. The orchard can be left in clover for two or three years if the growth of the trees is satisfactory, but if it becomes necessary, it can be plowed in the spring and after working it over every ten days or two weeks up to the first of July, it can be again seeded to clover.

In some cases the cultivation is confined to strips on either side of the tree rows, or in others where there is danger of winter killing of the trees, the strips along the tree rows are left in sod and the cultivating is done in the center between the rows.

In some sections mulching is used to take the place of cultivation, or perhaps supplement it in some cases. It is particularly valuable where the orchards are upon steep slopes which might be badly injured by washing if kept in cultivation, or where the land is too rough and stony to make cultivation desirable. For the purpose of mulching the trees, straw, waste, hay or any similar vegetable material might be used. This not only acts as a mulch to keep down grass and weeds, thus conserving all the moisture and plant food for the use of the trees, but it lessens the injury from deep freezing of the ground in winter and as it decays furnishes a large amount of humus and plant food for the trees. Good results should not be expected unless a sufficient amount of mulch is provided to prevent the growth of grass. It should be eight inches deep over a circle the diameter of which is at least two or three feet greater than that of the branches. Many of the failures where mulching has been tried have been due to the fact that the mulch has been packed about the trunks of

the trees or spread so thinly that it had little effect upon the growth of grass.

If the trees do not make a sufficient growth or the size of the fruit indicates that plant food is lacking, it is well to use strawy manure for a mulch, or to supplement the mulch of straw with a proper amount of manure or commercial fertilizer. Handled in this way the growth of the trees will generally equal that produced by cultivation, provided the soil is reasonably moist.

When mulching is relied upon for the orchard, the ground between the rows can generally be seeded to clover to good advantage. Especially after the trees begin to bear, it will be well to leave the crop on the ground after using what is necessary to keep up the mulch beneath the trees. Of course, if straw can be readily obtained for the mulch, and manure for supplying food, it might prove better to take off the clover or grass and feed or sell it.

It is only under exceptional conditions that a true sod mulch will give the best results in an orchard. In speaking of a sod mulch it is understood that the grass upon the land alone is used as a mulch, but if supplemented by straw or strawy manure so as to make it really a mulched orchard, better results can be secured, especially for trees that have reached a bearing age.

Under good conditions and supplying the needed amount of plant food, good results can be secured either by cultivation or mulching. Although seldom practiced so as to secure the best results, where orchards are mulched various advantages over the tillage can be secured. First, increased hardiness due to the fact that they ripen earlier in the season and because the mulch lessens the depth to which frost penetrates; second, the fruit is generally higher colored and firmer, which gives it superior keeping qualities. On the other hand, although the trees that receive the highest cultivation are more subject to the attack of fungous diseases, the mulched orchards suffer more than those cultivated from the work of insects, as the mulch forms a harboring place for them while if the land is cultivated, those which attempt to pupate in the ground will generally be destroyed. Great care must also be taken in mulching orchards to protect the trees from the attack of mice which make their nests in the mulch and feed upon the bark of the trees. This, however, can generally be prevented by banking the soil about the trunks or enclosing them in wrap-

ping or building paper, wooden veneers or wire netting. In some sections orchards also suffer seriously from fire when mulched.

SPRAYING.

Particularly in bearing orchards, if any one operation should be thoroughly performed, it should be that of spraying, by which is meant the application to the trees, at the proper intervals, of remedies for the control of destructive insects and diseases. The latter will always be found present and even greater losses are inflicted in seasons favorable to their development by various fungi which attack either the tree or the fruit.

Up to within the last twenty years the various blights, mildews and rots to which fruit is subject were ascribed to the effect of the weather, or similar causes, but it has been found that in every case they are produced by minute fungi which feed upon the tissues of the fruit or foliage and destroy them. These fungi are minute plants which develop from spores. These fall upon a leaf and in the presence of moisture germinate and reproduce. Experiments have shown that the germination of the spores can be prevented by a very small amount of copper sulphate upon the leaves and upon this is based the modern practice of spraying. The fruit grower endeavors to keep the new growth covered with a spray of copper sulphate and to repeat the application sufficiently often to keep the foliage as it develops protected and also renew it when it has been washed off by rains.

For various reasons the application is made in what is known as Bordeaux mixture consisting of about equal parts of copper sulphate and lime made into a thin wash. The first application should be made just as the blossoms are ready to open. At this time the flower stalks, the ovary and sepals can be coated, rendering them immune to the attack of the scab until after the fruit has set. At this time the small fruits are very delicate and if it happens that the weather is cold and wet and thus favorable to the development of the scab fungus, a very serious, if not entire loss of the crop may result. This was very noticeable last spring in Michigan, where the conditions were such that practically all of the fruit dropped off the unsprayed trees, while those that were thoroughly sprayed gave nearly full crops and thus the returns were sometimes equal to twenty times the cost of spraying.

It is also well to use some form of arsenic with Bordeaux mix-

ture for the destruction of leaf eating insects. It often happens that the canker worm and others of a similar nature do serious harm to the foliage at this time. The plum curculio frequently appears before the fruit has set and as it feeds upon the leaves, great numbers of them can be destroyed by this early application.

Then, a week after the fruit has set another spraying, using the same materials, should be made. At this time the apples will be erect and the calyx lobes will be open, making it possible to have some of the spray reach the inside of the calyx and thus put it where it will surely poison any of the larvae that attempt to enter the apple. Spraying at this time will also coat the small fruits with a fungicide which will do much to save the crop from injury by scab. It will also be well to repeat this application two or three weeks later both as a precaution against the scab and to help in keeping down the coddling moth, the larvae of which will appear at about this time and will feed more or less upon the foliage. These three applications will ordinarily suffice for the early part of the season unless they are washed off by dashing rains, when they can be replaced, but in all sections where the scab is troublesome late in the season, and particularly where injury can be expected from the codling moth, it will be necessary to spray the trees about the first of August. One application will do much good, but many think it well to repeat the spraying at the end of two weeks for winter varieties.

For the application made before the tree blossoms and immediately afterwards, it will be well to use four pounds of copper sulphate and six pounds of lime for fifty gallons of water, but this may be reduced to three pounds of copper sulphate and five pounds of lime for the later applications and many who make two sprayings in August reduce the amount to two pounds of copper sulphate and three pounds of lime. For the destruction of the leaf eating insects Paris green has most commonly been used at the rate of one pound to 100 gallons of water, or 150 gallons, according to the size and prevalence of the insects, but this is likely to burn the foliage unless an excess of lime is used and it is readily washed off besides being quite expensive at the present price. As a substitute arsenite of lime, prepared by boiling one pound of arsenic and two pounds of lime in two gallons of water for one hour and then diluting to 150 to 200 gallons, is used. This gives equally good results at one-fifth of the expense. This, however has all the faults of Paris green and, although consider-

ably more expensive, the increased efficiency of arsenate of lead has induced many to rely upon it. This is applied at the rate of two to three pounds in fifty gallons of water although some use it at the rate of one pound in fifty gallons supplementing it with about five ounces of arsenic prepared as above directed. Arsenate of lead has unusual adhesive properties and can be used at any strength without danger of burning the foliage, thus making it possible to use several times as much arsenic as in either of the other forms. Where the cost of arsenate of lead is thought to preclude its use it might perhaps be used for the last sprayings in June and in August.

SPRAYING FOR SAN JOSE SCALE.

This dreaded insect has done much harm in many of the states, but from its behavior in Michigan, I judge it is not likely to give much concern in Wisconsin except perhaps in the more southern counties, but even if it does appear, it can be readily held in check by the use of lime and sulphur solution either home made or one of the commercial brands. The treatment should be very thorough and will be found most effectual just before the buds open. While it cannot be regarded as giving as good results as Bordeaux mixture against the scab, it will be found an excellent fungicide and will also have a wonderful effect in cleaning the trees of rough bark and lichens.

While the fruit grower in Wisconsin will have conditions to meet which will not apply to the apple grower of many of the other states, on the other hand, he will have many advantages and if attention is paid to the details when locating and planting the trees to give them proper care in the way of cultivating, pruning, fertilizing, and spraying, there is no reason why the trees cannot be made even more productive and profitable.

DISCUSSION.

Mr. Richardson: I would like to ask Prof. Taft if he has used the dust spray.

Prof. Taft: I have been using various dust sprays for some fifteen years. I got an outfit I think it was 1889 or 1890 and tested it pretty thoroughly then and some seven or eight years

ago, when they commenced to take it up again, I obtained two or three different kinds of dust sprayers and tried all the different formulas that I could get hold of and bought some of the commercial mixtures, so that I had some experience with dust sprays, but I have not used them for two years, and that perhaps tells the whole story. I think the dust sprays are valuable against the plum curculio; I had very good results in keeping them down by dusting the trees and where I do not care to spray for the fungi, I would recommend the dust spray to carry an insecticide, that is, Paris green, for instance. You can put it on with very little labor and very rapidly, too, but I have never been able to control any fungous diseases and as I wish to control those and hence wish to use Bordeaux mixture, I merely put in my acetate of lead and Paris green with the Bordeaux and it gives me no extra work, whereas, to go over the trees with the dust spray would be so much extra work. I know a large number of growers at the time this was brought up six or seven years ago purchased some of these orchard outfits. I do not know of one that was used more than two years.

Dr. Loope: I would like to ask whether you consider that you can control the curculio with liquid spray.

Prof. Taft: Yes.

Dr. Loope: Absolutely?

Prof. Taft: Why, practically so, yes. In case of plums, they are perhaps worse there, the number we can save is a very large percentage, 90 per cent perhaps, and although you occasionally find one that is stung, the percentage is very small. The only thing is the thoroughness of the spray, get it on before the trees blossom, kill the beetle as it comes from the ground. The number that you can kill in larva form is very small of course. I think though, from my own experience, that the spray after the fruit has set and eggs are laid, if you do a thorough job, enough poison gets into the cup so that you can kill them, but I rely on the early spray for this insect.

Mr. Kellogg: Does not the curculio get out early enough so as to be there before the plum forms.

Prof Taft: Yes, that is the very point about spraying at that time; you kill the beetles before the plums are formed and of course before the eggs are laid. I think that is the way to do it, and the failures, I am sure, have been due to the lack of spraying at that time.

Mr. Toole: Do you spray more than once to keep clear of curculio, or is that one spray sufficient?

Prof. Taft: I like to spray all trees about four times, except perhaps the peach. I would spray, for instance, all fruit trees just before they blossom and just afterwards. With us we had a great deal of trouble from the different shot hole fungi, the different leaf blights that cause the foliage to drop from the trees in perhaps July or August and where we have sprayed those after we have gathered the cherries, or in case of the early kinds of plums, after we have picked the plums, we can hold that down very largely. In the case of late kinds of plums, those that ripen in September, we spray those about the middle of July, and can hold the foliage on; for instance, the prunes, which are the worst of all that we have in this respect.

Dr. Loope: Speaking of the plum curculio, is it the same insect as the apple curculio?

Prof. Taft: The plum curculio works on the apple and oftentimes does more harm than anything else we have because the fruits drop. Of course there are other curculios, but the same things holds true, that the spray will destroy them, and while I have seen many unsprayed trees with the ground literally covered with fallen apples in which you would find one or a dozen perhaps of curculio marks, right along in adjacent orchards where the trees have been sprayed you would find very few fallen fruits and practically no curculio. If you spray the trees just after blossoming, you can control that insect as well as anything else that is on the foliage.

Mr. Kellogg: Would not you spray before the buds start?

Prof. Taft: Well, you will find in my spraying calendar that I have that put down as one time for spraying. The point is, I want to spray once before the trees blossom; I think a spray of Bordeaux just before they blossom is the best of all, but if there is any chance of your not doing that, I would spray with the copper sulphate solution. I rather prefer the copper sulphate, for the earlier spray, just as a sort of disinfectant, cleaning up the trees, when it comes to lasting effects, when you want to cover over the new fruit and new growth, then you want to use the Bordeaux.

Mr. Kellogg: How would you make two pailfuls of Bordeaux for a common little garden?

Prof. Taft: That would be perhaps five gallons. I would

take one-tenth of four pounds, a little less than one-half pound of copper sulphate, and if I had an old wooden pail, I should put it in a little sack, let it hang in there over night and dissolve it. I would take about the same amount of lime, about one-half pound of the slaked lime, slaked with hot water. You would not succeed very well with a small amount of lime, unless you had hot water. Slake the lime, fill up the pail with water and mix the two together.

Mr. C. L. Richardson: I would like to ask the one requisite of a good spraying outfit.

Prof. Taft: Well, there are of course a number of them. I would want in the first place that it should be durable, that it would not wear out the first season and hence would want one with the working parts of brass and one that would not require too much muscle in working. There is a great difference in pumps. The pumps that have a stuffing box work harder than the others. There are two or three that are all right that have stuffing boxes, as we call them, but my idea would be to take any pump where it is down in the barrel. I would say that our growers who have from ten acres up are making use of power outfits and they certainly are getting remarkable results. I think one reason is that they are more thorough. A man who is pumping does not perhaps keep up the pressure and is in a hurry to get through and will not stop long at a tree, where if the engine is doing the work, that means that we get increased thoroughness and the increased pressure enables the mist to reach all parts of the tree.

Mr. Toole: I would like to ask what the process is in the preparation of the arsenate and lime.

Prof. Taft: There are two or three ways. I commenced making it in a small way by using one pound of white arsenic and two pounds of lime. I slaked the lime just as for Bordeaux mixture, put this in two gallons of water, one pound of arsenic and two pounds of lime and boiled it for about an hour. That contains as much arsenate as practically two pounds of Paris green.

Mr. Toole: Do you make up your arsenate of lead or buy it?

Prof. Taft: Generally buy it, it is cheaper to buy it.

A Member: I would like to ask Prof. Taft whether he considers a compressed air sprayer practical for large orchards, worked with the sprocket wheel?

Prof. Taft: Some of those work very well. I have known them to be used on the largest apple orchards thirty to forty years old. For myself I prefer not to rely on the traction outfits, except for medium sized trees, trees ten to fifteen years old.

Dr. Loope: About what pressure would you use?

Prof. Taft: One hundred pounds or thereabouts, 135 is not objectionable, but 100 is a good average pressure and with a hand pump it is pretty hard work to keep up sixty pounds.

Mr. Henry: Are the gasoline engines easier to use, or are they apt to break down?

Prof. Taft: The Michigan growers have been using them a great deal in the last three years and in our larger fruit section I think there are ten gas engines to one of every other power pressure. They keep getting them, that indicates that they like them. It is becoming more simplified and they have strengthened the weak parts so that they are certainly giving good results. I know that in Western New York they are relying largely on the gasoline outfits. If a man has no taste for machinery, I would suggest the use of the gas sprayer from the fact that all you need to do is to turn the cock and go to spraying, no machinery whatever, but they cost more than anything else. It costs about one-third of a cent for each gallon you put on for the power.

A Member: How much stronger do you have to use arsenate of lead for potato bugs than for the codling moth?

Prof. Taft: Almost double; I use about four pounds for the bugs and two for the codling moth.

Mr. Henry: Can a power potato sprayer be fixed over for a power orchard sprayer for a young orchard in Wisconsin?

Prof. Sandsten: In regard to potato sprayers used for orchards, most potato sprayers are traction sprayers and they are not well adapted for orchard spraying. We found we could not get up pressure enough to spray a tree in an orchard and I hardly see how an ordinary spraying machine used for spraying potatoes can ever be used in an orchard.

Mr. Bingham: We have a man here that has used one of those traction power sprayers on trees thirty to forty years old.

Mr. Buehler: I used one and had very good results. I would not want anything better, would not exchange it for a gasoline outfit to-day. It has not been any expense, no power, for I run it with one team, spraying all alone and I have sprayed from forty to seventy acres a season.

Prof. Taft: We have hundreds of them in Michigan and I know men that are just as enthusiastic as this man here. I know one man that got one five years ago, used it, liked it so well, got another next year, and he has trees thirty to forty years old and he likes it very much, but I know a great many others who do not like it for large trees. For trees fifteen to twenty years old they are all right. I know a man that had three or four of them that preferred them to gasoline engines, but the majority do not like them for very large trees.

Prof. Moore: Talking about spraying for the San Jose scale and about San Jose scale being found in Wisconsin, we had a report that there was San Jose scale in Outagamie county this summer. I took occasion to go there and found that it was oyster-shell bark louse. So far as we know there is no scale in the orchards, although we do run across it sometimes in the nurseries.

COMMERCIAL ORCHARD SESSION.

THE OUTLOOK IN THE EXTREME NORTH.

WM. KNIGHT, Bayfield.

I wish to say to this convention that I am not an expert fruit grower in any sense, and cannot be classed with you skilled and scientific men in that line, to whom the world owes a larger debt than they will ever pay.

I am here from Bayfield Co. representing an unknown land, a district (except to its citizens) so little known, and its natural conditions of soil and climate so different from that nonresidents expect we should have, that it is a difficult matter to have them take us at all seriously when we explain to them our prospects and possibilities in the fruit line. They have been so accustomed to hear of Lake Superior, only in connection with cold weather, snow and ice, that they cannot comprehend how it is possible to grow fruit so far north, and until you get on the ground and see the trees and fruit, you still retain a skeptical mind, no matter what others may say. I want to definitely get before you the district that I am speaking of. It is a strip of

territory starting about five miles south of the town of Bayfield, reaching back from three to five miles from the lake and extending west along the coast line about forty miles, also all the Apostle Islands. There are twenty-two of these islands, and each island has from three hundred to five thousand acres, so you see the territory I have set off, comprises a large amount of land, and is known locally as the Bayfield peninsula and Apostle Islands, nicknamed the banana belt of Lake Superior.

This district that I have designated has been pretty well tested in growing apples, cherries and all small fruits and berries, for thirty years or more.

Now I do not say that this is the only land in Bayfield county that would produce fruit. The whole county might be good fruit lands for all we know, but I say I do not know, and we have knowledge and reasons for believing it would not be. Certainly these outside lands would not be the success that the Bayfield Peninsula would be.

It has been long noticed that our best apple orchards in northern latitudes were only made possible from the influence of large bodies of water, and were it not for the influence of our deep water lake we would not be able to grow much fruit.

There are so many things to be reckoned with and woven into the fabric pertaining to the commercial orchard that I shall content myself by giving you an outline of the facts and conditions as I see them after thirty-seven years observation of that country and you must judge for yourself whether a commercial orchard would be a success.

The climate would be a revelation to some people, expecially the winters, in the thirty-seven years of my experience on the Bayfield peninsula, I never knew the thermometer but once to get as low as thirty-two degrees below zero. In ordinary winters, the temperature will not reach lower than twenty-five degrees below, more than once or twice during the winter. The greater portion of winter is vibrating from twenty degrees above to ten below. So far as even temperature is concerned, we can beat the southern portion of the state by long odds. In fall when we get winter weather, it stays winter until spring. Same way with snow, it comes in fall and stays until spring and the ground never freezes. Occasionally we will have a winter with little snow then the ground freezes some, but not deep, as there is always snow enough to protect the ground some.

You might ask what causes this mild even temperature so far north and those conditions do not obtain every where on Lake Superior. If you will take the map, you will observe that there is but one wind that can blow on that peninsula, but must first travel from twenty-five to three hundred miles over water before it strikes these lands.

Lake Superior is a deep water lake, and outside of the islands never freezes, and tempers every wind that blows except a south west wind. Winds off the lake are our warmest winds in the winter, and the coolest winds in the summer. So you see our fruit trees are getting the benefit of that lake both winter and summer.

Our winters break suddenly in the spring months, and summer is upon us, and in a few weeks the trees are in leaf and everything growing.

Ordinarily it is not necessary to mulch strawberries as the snow protects them sufficiently. In fact, the growers of strawberries never mulch, and they never have a failure.

The soil of the peninsula is mostly sand and clay, mixed with gravel and stone. It is a moderately strong soil and a warm one, and appears to be the best soil for all kinds of fruits and berries, and produces high colored, firm and well flavored fruit.

Our apples lead any district in the state, for firmness, flavor, high color and keeping qualities. Yellow transparents will keep from two to three weeks. Duchess until the middle of December, Wealthy until January, and Wolf River until April, all this without cold storage and in an ordinary cellar.

Cherries are a sure crop, tree does well and bears abundantly. To my knowledge we have lost but one cherry crop in fifteen years. We have a cherry up in that country that has been grown for the last fifty years, how much longer no one knows, possibly a hundred years. That cherry was introduced on Madeline Island by the Jesuits or the fur traders. As far as history goes it was allowed to grow and reproduce itself by throwing up root sprouts. They were never cultivated and the fruit has never deteriorated in color, size or flavor. It has all the appearances of the Early Richmond, but is two weeks later in ripening, and will hang on the tree two weeks after ripe. The tree is a hardier tree than the Richmond, perhaps this would be a valuable tree in some districts, where other cherries fail.

Now as to the smaller fruits and berries, such as strawberries

raspberries, blackberries, currants and gooseberries, we stand ready to compete with any section in the State as to quantity and quality.

The first discoveries of these fruit lands in Bayfield County was made about forty years ago by a lighthouse keeper and a real estate man. The lighthouse keeper to show his faith established a nursery on Michigan Island, fifteen miles from the main land. And there is evidence of that Old Nursery yet, apples, pears, cherries and plums are struggling away in the brambles, and produce some fruit. The real estate man got busy and got out a map showing the Apostle Islands and Bayfield county, and headed it in large letters "THE FRUIT FIELDS OF THE NORTHWEST." Both men were progressive men, but they were fifty years ahead of the procession. About that time the lumberman appeared on the scene. Well you all know how a lumberman likes to farm, he reaps but never sows. Of course the nursery went to brambles and the land agent took the lumberman's cue and wiped off the legend from his map, "The fruit fields of the Northwest." And to the world they have been unknown since. Our production of all fruit has been in a small, careless hayhazard way, by men that grew for their own consumption only. A few of course have a surplus which is sold. These trees of all ages up to thirty years old are thrifty and bear abundantly and never had any care or attention that a commercial fruit man would naturally give to his trees. And every thing in evidence goes to prove that fruit can be grown successfully on the Bayfield peninsula, in a commercial way. There is one winning feature of our climate up North. Fruit of any kind from the strawberry up to the apple never met with accidents, in the spring. Late frosts in the spring never kill fruit blossoms. Thus every year we have a sure crop of all kinds of fruit. And they all load up heavily with fruit.

Now I have shown that the fruit is a sure thing. You have got the fruit and the next thing is to get it into the market. And there is where we excel.

We are located well up into a non-producing fruit region and have the best and highest priced markets of the whole country located conveniently all around us. We can reach by water, many large and good markets in five or six hours. And by rail in ten to fifteen hours we can be in every village within a radius of four or five hundred miles, and the condition of that mar-

ket when we get there, is as clean and hungry as a hound's tooth, and not a competitor in sight, they have all had their rush together, glutted the market, destroyed prices, and some gone home financially crippled. We step in after the crash with our high colored, high flavored fruit when everybody is fruit hungry. Ask our own prices, sell everything quickly and go home jingling the gold dollars in our pockets happier and wiser men. Thus it is in every line of fruit we grow. We enter the market when it is naked and bare.

Our strawberries ripen after all other sections of the country have marketed their crop. So it is with our raspberries, blackberries, currants, gooseberries and cherries.

How is it in the apple line? The summer apple, Yellow Transparent when it is ready for the market, there is not an eating apple on the market. It ripens about the same time as the Duchess in more southern latitudes. Our Duchess goes to market when all other Duchess are done for. That is an apple we are especially proud of. It will hang on the tree until it is thoroughly ripe and highly colored, very juicy, hard and firm as a Baldwin and will keep two months after being picked.

Our Wealthy go to market when about all fall apples are gone and the winter apples are not in eating condition.

Now for crab apples, there is no place on earth, especially so in the Northwest, where the Transcendent Crabs will be so firm, hard and juicy, clean and even-colored as those we raise up in that Northern Country. They go to market in such condition they command the highest price and no section can compete in quality and price.

So it is with every fruit we grow appears to have a market all its own. Now to sum up the faith that is in us for a commercial orchard. The prominent essentials are: We have got the climate and soil to produce the fruit. We do produce the fruit not one year but every year. Our near markets are unlimited. We enter markets when there are no competitors and can demand a good fair price for our fruit. Our fruit will rank equally with any produced anywhere, and in some respects better. With this showing before us, we expect in a few years to show to the state the possibilities of her richest fruit district, and in time we will ask that the old legend be placed back on the map "The Fruit Fields of the Northwest," and that the Bayfield peninsula will no longer be nicknamed the banana belt, but the golden

fruit belt of Lake Superior that being indicative of the golden dollars of the fruit man's harvest.

DISCUSSION.

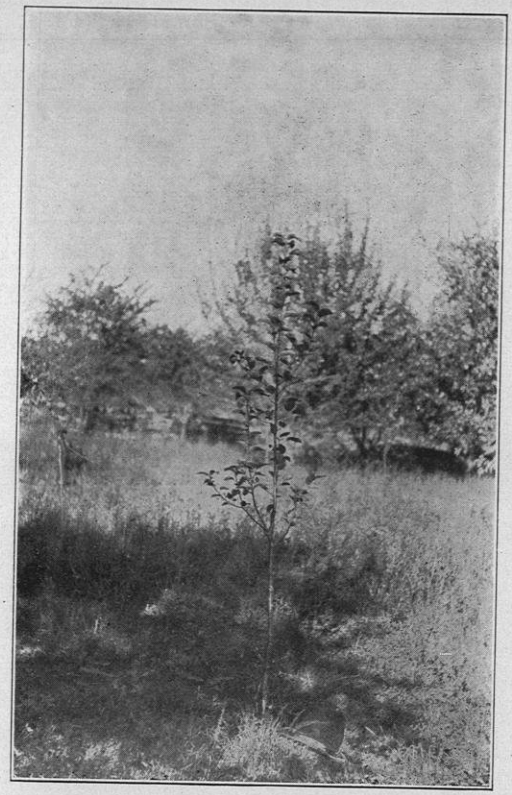
Prof. W. A. Henry: It has been my pleasure to have something to do with the development of Northern Wisconsin. It was I who caused a bill to be introduced into the legislature looking toward the publication of a book of 50,000 copies, which describes our New North and when that matter was in progress, a good friend of mine, one of the leading citizens of this state, came to me and said, "Prof. Henry, are you not making a mistake when you say there are agricultural possibilities in the North? Do you realize what you are saying? You are Professor in the University, you should be careful." I said, "I have been on the North Shore, I have been all over there, have been up to St. Paul and Duluth and so on, and I have seen the country all along there. Now, I realize my position and I am going to stake my reputation on the agricultural future of Northern Wisconsin." I published the book, settlers poured in, the country is steadily filling up, and a commonwealth developing. Now, I wish to say there is a region still undiscovered and the gentleman who has read the paper is one of those who went up there as a pioneers. The land immediately adjacent to Lake Superior and that immediately drains into it is the country that I wish to consider, that and that only, I am speaking particularly of that close to the lake. You must remember there is the largest fresh water body in the world enormously deep, cold all the time, warm relatively in winter, but cold all the time. Now, I want to say that for apples of certain kinds, for cherries and for some of the small fruits, currants, strawberries and raspberries, that there is one of the most promising regions in all America today for the enterprising horticulturist. I want to say to you who get the pamphlets advertising such countries as the Hood River Valley and Wenatchee Valley, I have been in most of those places and studied them and while you can grow finer fruit in those valleys, while your trees will bear younger and more prolific, you must remember the enormous tonnage you will pay he railroad companies, you must remember that only the choicest apples are put in those

boxes, and that they must be hauled over two ranges of mountains and across the desert to find the largest population. Now that region never can produce apples in quantity and never will, but what we want to know is what we can do ourselves individually and you that are looking with longing eyes toward the far West and to those pamphlets so gorgeously pictured, telling of the trees they can grow there and telling what prices they are getting there, do not be carried too far off your feet. If you want to find a profitable region for your enterprise, you will find it right near the shore of Lake Superior, just as the gentleman has described. Now, do not get carried off your feet by thinking there is something better way off. It is not necessarily true. You may go to the West and do well, you can stay right in Wisconsin and do well. I wish to say that nearly all fruits do well and not only fruits, but that legumes flourish in a surprising degree. The College has branch stations near Lake Superior and this year a man threshed eight bushels of alsike clover seed from an acre; that seed was worth about $10 per bushel, so he received a return of $80 from one acre of alsike clover seed. We almost duplicated that. The college had a clover huller taken up there to help the settlers. Now the pea canning industry is going to become an enormous one on Lake Superior and I want to go on record in the publication of this Society as predicting that in the near future—it will be a number of years yet, because the land will only clear up slowly, but in the not distant future, there will be pea canning establishments all along the south shore of Lake Superior that will be putting up the finest peas by the millions of cans that will ever be sold in the market, and the region will be famous for canned peas, clover seed, alsike and hemp. Small fruits, apples and cherries will be grown in that region and people will be thanking Lake Superior for its great refrigerating powers. The time is not far away when the people of Wisconsin eating their first strawberries, coming from Texas, Louisiana and Florida, will eat their last strawberries furnished by the carload and train load from the Lake Superior regions. Now these are prophecies, and while I may not live to see them, there are those in this room that will live to see them and I do hope there will be some here that will go up there and help pioneer that country and help develop it and bring about some of these things that are sure to come and do not be carried

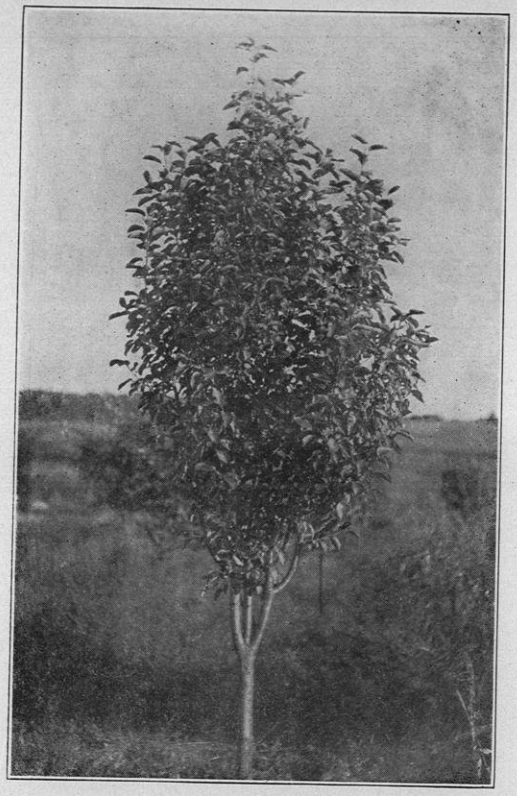
away to other regions until you have at least looked into the possibilities of the region that I speak of.

Mr. Bennett: I would like to add a word and that is that for twenty-one years I have traveled up to Bayfield and along that country and I saw the corn green there long after it was frost-bitten in the southern parts of the state, green as grass, and I have seen the fruit there and Mr. Knight I knew a good many years ago, if I recollect right, he was a sawmill man and I sold him some oil once.

Mr. Knight: I will say to the gentleman that I have been one of the pioneer lumbermen of that country for many years, and now I am a pioneer fruit man. I am settting out an orchard, I have thirty acres of apple trees two years old and I am going to put out more, make it forty acres next spring. I am going to test the strawberry culture and I have a number of other friends up there that have bought land and gone into business there in the same way. They are far more skilled than most of us, that is, I do not claim to be skilled in growing fruit, all I claimed to be skilled in was in cutting down trees, now I am going to get skilled in growing some. I see my neighbors everywhere with trees, with cherries, with every kind of fruit that I can think of, up in that Northern country, growing without any care, without any attention whatever, and I believe that a man that is skilled in the business, who has brains or the scientific knowledge, can go up there and beat the world anywhere, I do not care where he goes,—in prices I mean. It is just from the fact that I stated, that he has the market where no other man can compete with him in everything that he raises, he can ask his own price. I know of a man right near town, a laboring man in the sawmills there, who bought a little piece of land from his neighbor and last year he grubbed and cut down the bushes and plowed a little around the stumps and planted one sixth of an acre of strawberries and last summer he sold $214 worth of strawberries off that one-sixth of an acre. How did he do it? He got from 12 to 15 cents for every quart of berries that he sold. I presume he did not raise any more strawberries than the rest of you would raise, but he got a better price for them Speaking of vegetables, I do not believe there is any place on earth where you can grow finer vegetables than you can right up in that northern district. The peas are the finest in the world, the sugar corn is the finest and sweetest in the world. You will



(A)



(B)

Sod vs. Culture.

Two Whitney crab trees similar in age and size when planted. "A" in sod, "B" in cultivated field. Trees stand less than 20 rods apart. The sod land much richer than the cultivated field, and the latter cropped between trees. Three years planted. Near Madison, Wisconsin.

(A)

(B)

Two Wyant plum trees under conditions similar to Whitney crabs shown in preceding figure. A in sod, B cultivated. Can we expect success by planting fruit trees in sod? Volumes of argument cannot answer this question better than these pictures.

see Evergreen corn standing there green six feet high, some of it, when out around in this country everything is killed with frost. You have an earlier spring than we do, you get the benefit of the spring sun much sooner than we do, but in the fall we put you all out. We have grass until the snow covers it up that is green and in the spring when the snow melts off in one week, that grass is green and growing like a weed. That is the kind of country we have.

The Secretary: While I agree fully with all that has been said and can certify to a large part of it, I think this point cannot be too strongly emphasized, viz., that the region that Mr. Knight and Prof. Henry have spoken of is comparatively limited in area; that we should speak of the Bayfield region, or the Bayfield peninsula and not of Northern Wisconsin. I got into considerable trouble a few weeks ago in objecting to some statements that I feared were about to be put out that Northern Wisconsin as a whole was the "banana belt." Now, I think we need to be very careful here in going on record in that respect, because, as you know, though the gentlemen who have spoken here are wholly unprejudiced, that it always happens that there are people who are following in our trail who are not so unprejudiced and others who are apt to take up their words and change them somewhat, because I believe all of you who are familiar with the conditions will agree that there are immense areas in Northern Wisconsin where probably fruit cannot be grown, ever, successfully. I have in mind that immense region known as the Lake Superior Red Clay region, that great bowl of thousands, probably millions of acres with a sticky red clay soil, where the Horticultural Society has not up to date succeeded in even starting fruit trees, to say nothing about getting fruit from them, and we have been trying there for four years. A little later on in the program we will hear from other sections in the state which will probably emphasize what Prof. Henry has said, that Wisconsin is the place where money may be made from growing apples, not the far West. I stated four years ago before this Society that I firmly believed that in the southwestern part of the state more money can be made from growing fruit under certain conditions than in any other part of the United States, and with three or four years' further observation, I am willing to repeat that statement. It is likely that there are other sections and it is possible that the Bayfield region may also be put in the same

class, but I think we should be very careful to emphasize the fact that there is but a limited region and it is not all Northern Wisconsin where these conditions prevail.

Mr. Delwiche: In regard to that red clay, I worked in that section and I want to say that you can raise strawberries on that red clay. I know a party living at Superior who has marketed $800 worth of strawberries from one acre and has done it three years in succession and there are other people who are doing as much. I will not say that all fruits are going to succeed very well on the clay belt, but I believe along the lake from Superior eastward, there are many sites where apples can be raised profitably. I am not talking about the Eastern apples, like the Baldwins or any of that description, but I believe that the Duchess and even the Wealthy will thrive as far westward as the city of Superior and so far as the strawberry goes, I can say that there are very few localities near here that are as well favored as that belt adjoining the city of Superior. I believe that section is better favored in the matter of the strawberry than is Bayfield peninsula, not climatically, but because of nearness to market. There is a market there, probably better than any in the country, and you can raise the berries, you can go throughout that section and you will find men who are making as much on those patches of land from one-half to one acre as other people are doing on five or six acres in other sections of the state.

The President: In justice to the other sections of the state, as interesting and entertaining and profitable as this particular topic may be, it seems that we shall have to close this and give some of the others a chance.

COMMERCIAL ORCHARDS IN THE CHIPPEWA FALLS REGION.

C. L. RICHARDSON.

While it has cost our section thousands of dollars and our fruit growing pioneers four decades of their lives to realize some of the failures that must inevitably attend certain lines of endeavor, while we hope to profit by their experience it is I shall assume their successes that are to be presented.

Our section in common with the rest of Northern Wisconsin is ancient, much eroded land bearing everywhere the imprint of the glacial epoch. At every falls and rapids of the Chippewa River outcrops of granite are to be found indicating apparently the original igneous rock at no great depth. The surface soil is either (1) light sand, (2) sandy loam, or (3) stiff clay.

Our successful orchards are with a few exceptions located within the limits of a parallelogram beginning perhaps ten miles southwest of Chippewa Falls and extending northeast for forty miles to the junction of the Chippewa and Flambeau rivers. Moreover they are all found on one fixed type of soil. Its surface is broken and hilly, an ascent of one hundred feet from base level to hill-top sometimes appearing. These hills frequently appear as chains or ridges whose prevailing trend is north and south.

The soil is a heavy clay, red or slightly yellow, very fine, adhesive, comparatively impervious and hence retentive of moisture, showing under the microscope some quartz and mica and a large amount of feldspar. It is a cold soil, that retards spring growth, promotes early hardening of wood, and discourages untimely fall growth when the weather chances to be unusually warm. One orchardist reports a clay loam containing sand, and another a loam surface underlaid by eleven feet of clay.

This clay varies in depth from eight to thirty feet; perhaps ten to twelve feet is a fair average. In places it is interspersed with stones or boulders, but in the better sites these are absent. The clay is underlaid by gravel, sand, and in places, sandstone.

The forest which originally covered this land consisted of red and white oak, basswood, ironwood and birch, interspersed with ash or poplar, and occasionally a maple, butternut, or blue beech sapling. Hard maple occurs in a few places, while the pine is conspicuous by its absence.

While it is impossible to state the extent of the orchards in this section, perhaps three hundred acres in commercial orchards is a conservative estimate. By a commercial orchard is meant one of at least an acre and a half in area, some part of the crop of which is sold. Of this three hundred acres two-thirds is grouped in a single township, the component orchards ranging from five to sixty acres.

An investigation of exposures fails to show any superiority in northern or northeastern slopes. The larger orchards extend

over hill and hollow presenting slopes and exposures in all directions; the smaller orchards face any way that happens, and I have neither seen nor heard any claim concerning the superiority of a northern slope. On the contray, a few orchardists express a slight preference for a southern slope. We have orchards on level ground, on hilltops, and in the valleys between, and all seem to thrive equally well so long as they are high enough to secure proper drainage and circulation of air. The best orchards have almost ideal drainage conditions. Water never collects upon them, winter nor summer, while the moisture-retaining soil is not injuriously affected by the drouth of summer.

Herein, I believe, lie the limitations, which have so far, confined our orchards to the particular type of soil previously mentioned. The apple tree has seemingly no predilection for clay soil, but it does require a strong, deep, fine soil, unaffected by drought. These conditions cannot be fulfilled by a sandy loam hence the constant recurrence in our orchards of the one type of soil.

Just when the apple industry began it is difficult to learn, but as early as 1867 a few trees were planted, mostly Transcendent and Whitney. The oldest of our present orchards were apparently established about 1870 or 1872 and a few of these old trees are still in existence. One of them a gnarled old Transcendent has a record of 27 bushels of apples. About 1890 many more trees were planted and the third period of marked expansion began about the year 1900.

Many trees have been the victims of improper methods of planting. People attempted to save labor by digging small holes, cramping the roots of the young tree and affording it insufficient root pasturage. Also there is danger that the spade or other implement used to dig the holes will leave a "plastered wall" about the hole, through which the fine fibrous roots of the young tree cannot penetrate. One of our leading orchardists uses about one-tenth of a pound of dynamite to open and loosen the ground. But it is not well to plant at once. Wait two or three days, or if possible until after a rain to allow the gases generated by the explosion time to dissipate.

The orchards of this section are planted in rows or squares at distances varying from fifteen to thirty-two feet. The direction of the rows depends apparently on the conformation of the

land, although some of our orchardists prefer rows extending northeast and southwest as a partial protection from the sun.

Apparently there are some forty or fifty varieties of apples grown in this section, twenty of which are crab apples and hybrids. Among the large apples which are grown the following are usually exhibited at the Northern Wisconsin State Fair.

Alexander, Duchess, Snow, Swaar, Fall Orange, Peerless, Pewaukee, Haas, Hibernal, Longfield, McMahan's, Okabena, Pattens' Greening, Northwesten Greening, Switzer or Red Queen, Wisconsin and Perry Russets, Talman Sweet, Totofsky, Utter, Wealthy, North Star or Dudley, Walbridge, Wolf River, Yellow Transparent, Newell's Winter.

Among the crabs and hybrids the most important are Briar's Sweet, Gideon's No. 6, Hyslop, Martha, Sweet Russett, Transcendent and Whitney.

Our most valuable apple is the Wealthy. In one sixty-acre orchard forty acres are planted to Wealthy. Many of our orchardists say that if they were to plant a 20-acre orchard it would occupy 15 acres. It is a good keeper, one grower reporting 10 bushels in his cellar Jan. 4th, while last year he kept them until spring. The trees can scarcely be called perfectly hardy. Some of them sun-scald in early spring and a few usually freeze out especially if the winter be severe. They are being more extensively planted than any other variety.

Perhaps the Duchess ranks second in importance though it is not being as extensively planted as some other varieties, especially in the larger orchards. It is a great favorite for fall use, and the tree is popular on account of its vigor and adaptation to somewhat loamy soils. It is a heavy bearer, begins young and lives for a good many years.

The Northwestern Greening is being extensively planted, probably ranking third among our apples. It is not perfectly hardy, but will stand four or five ordinary winters and then be killed by an unusually severe one. This is especially true if the trees have borne a heavy crop the previous summer. The young trees, not yet in bearing carry over well, even when the bearing trees freeze out. It is our only real winter apple, presents a fine appearance and sells well, in other words, it is a good commercial apple. One grower reports picking 20 bushels from 100 trees five and six years old,—their second crop.

The Fameuse or Snow is perhaps our best eating apple but

does not seem to be hardy enough to be generally grown. Almost every orchard has 2 or 3 trees but none have very many. Two veteran growers report that they cannot grow it on their hillsides but can grow it down in the valley between. The Pewaukee is unpopular, not very hardy and there is no money in it. The Longfield is badly handicapped by its small size, otherwise it is a valuable commercal apple, smooth, bright and handsome. The tree grows rapidly, bears young, attains a large size produces a large crop, and lives to a good old age. One grower reports the McMahan as not being hardy, but the great weight of opinion is that it is unusually so. Personally I am inclined to think that the McMahan, in company with the Wolf River, Duchess and Hibernal can be grown upon a greater diversity of soils than many of the others. I doubt if it is necessary to plant them upon the one type of soil so far considered—in fact there are a number of small orchards throughout our section upon loam where trees of three of these varieties have flourished for six or seven years past.

"The Wolf River," said one of our orchardists, "is hardy as an oak," but its quality compares favorably with cork. On account of its large size and fine appearance it has a ready sale. One grower sold twenty bushels this fall at $1.50 per bushel. The tree is too slow in coming into bearing. I have seen trees ten or eleven years old, fifteen feet high and have not yet borne. Nevertheless it is exceeded in acreage only by the Wealthy, Duchess and Northwestern Greening.

We have two valuable early fall varieties—the Yellow Transparent and the Tetofsky. The former sold last fall at $1.20 per bushel. It bears early, grows to a large tree, produces a heavy crop and is long-lived. We have trees thirty years old in our vicinity. Unfortunately it blights especially if the soil be rich.

Totofsky trees seem to be in demand—one grower said he would plant 500 trees if he could get them. One orchardist reports the Okabena as his best paying apple, and several speak in high terms of the vigor and productiveness of the Hibernal. But its quality is, as one of them said, "Even worse than the Wolf River."

For the present and the near future our commercial apples are Wealthy, Duchess, Northwestern Greening, Wolf River, Yellow Transparent, Tetofsky and Whitney. The McMahans,' Hi-

bernal, Longfield and North Star, are on the road but have not yet "arrived."

None of our orchards, except that at the State Home, are sprayed. So far, our orchardists have not found it necessary tc spray, but the time is fast approaching. The codling moth though not severe, is wide spread in its ravages. Ants have killed more trees than any other enemy. Mice also work considerable injury, especially in orchards that are mulched early with hay, straw or coarse manure. One grower reports the loss of one hundred trees during a single winter from this source. They occasion far more injury than rabbits. Limb blight and leaf blight are reported in a few instances, being I imagine local manifestations of the fire blight. In one orchard I have detected several spots which resembled apple canker.

Up to the present our orchards have been incapable of supplying the local demand, consequently there has been no shipping. But with the present rapid expansion of orchards, this problem will soon require solution. Meanwhile apples have sold at from 75 cents to $1.25 per bushel. One orchard of between six and seven acres sold a thousand dollars worth of apples this fall; while another of perhaps 12 acres containing many impractical varieties produced but $500. As yet, commercial orcharding is scarcely recognized as a visible means of support.

I fail to see that Chippewa county possesses any peculiar natural advantages over the rest of the world. Our land is as good as can be found anywhere and its cost is far below that in most other apple sections. Taxes are correspondingly light. Our railroad facilities are unsurpassed, furnishing cheap rapid transportation to the cities which lie north and west of us. We are so near the northern limit of commercial orchards at present that we will reap whatever advantage there is to be gained from a late appearance upon the market. While our range of varieties is limited, these varieties we can grow to a perfection of form, flavor and coloring perhaps not attained elsewhere.

We have the men, the market, the varieties and several hundred square miles of suitable land; no reason is apparent why the industry should not grow to a size commensurate with these advantages.

CENTRAL REGION.

DR. T. E. LOOPE.

Wisconsin is not an ideal fruit region on account of its severe winters and other climatic conditions not thoroughly understood.

Our people have been engrossed by our more favorable industries, lumbering, grain raising, dairy farming and manufacturing to such an extent that intelligent fruit culture has been confined to a few experimenters. I am of the opinion that the main reason for this is the fact that our early settlers being largely from the eastern states and finding that varieties grown there would not succeed here thought commercial apple growing impossible. This idea prevails even now. "They planted trees and they died." They have forgotten that they exercised some common sense in planting and caring for other crops. They know that corn and potatoes must be of tested kinds, planted properly, cared for with diligence and harvested in due season They understand that their cows must be selected carefully from milk and butter breeds, that they must be furnished good pasturage, kept housed in winter and fed on proper feed and milked twice a day if they are to succeed in dairying. Yet you are continually met by the statement that they have bought and "planted trees and they died."

With the ordinary farmer a tree is glad to die, and die young while it has a chance to go to tree heaven. It has a presentiment of dire results when it is stuck in the ground in a hurry to get the job done. It has that "gone feeling" all the first season and welcomes to its bosom the borer, the tent caterpillar and scale for companionship. Tremblingly it puts forth a few feeble leaves and its terminals show a stunted growth as if afraid to be called bold and aggressive in its growth. Then winter comes in and does the rest. If it should perversely show vitality enough to bud the next spring the plowman rakes off a great piece of bark when he drives past and when he harrows the ground he varies the program by running the drag over it. No wonder it gasps and dies. I have been a sad mourner at many such deathbeds but my sadness was mingled with a mad rage to brain the criminal.

"They planted trees and they died." It seems strange that I

have been telling facts but the above is no uncommon occurrence. In fact I have not told half the truth. If perchance it has lives like the fabled cat and grows haltingly until it is old enough to bear fruit it has not only the perils just enumerated to encounter but it is smothered by June grass, impoverished by cropping the ground or gnawed by mice so that if some year it blossoms and bears a crop of scabby apples the remainder of its vitality is sapped and it gives up the ghost. So the end of that thrilling life story is murder followed by suicide.

Can you wonder at the saying "They planted trees and they died." Do people ever imagine that trees have sensations or consciousness? Does it not bleed when broken or cut? Does it not shrink in agony when mortally injured? Does it not feed hungrily in health? Is it not reproduction of its kind as much an instinct as with animals? Can any wise man say that it has no soul?

As to the commercial possibility of central Wisconsin orchards it entirely depends on "The man behind the tree." If that personage will be so self confident or ignorant as to plant Baldwin, Northern Spy, Seek-no-further, King, Pippin or Ben Davis he will speedily join the hands of those who "planted trees and they died."

On the other hand if he plants Wealthy, Duchess, McMahan, Longfield, N. W. Greening, Patten's Greening, Hibernal and some others of the same class he will ere many years begin to wonder what he is going to do with his enormous crop.

But the "Man behind the tree" must come to the front in this problem, no skulking is allowed but he must be in the bright sunlight of common sense and diligence. He must have an elevated location with a soil in which clay has a generous admixture, with lime a constituent, with fertility kept at high grade and drainage in perfect condition. Given all this the man must plant properly and cultivate wisely. He must prune sparingly but well. He must protect from mice, rabbits and the tree assassin. Last and most essential he must love his trees and the tree recognizing this love and tenderness will reciprocate and unfold its buds and blossoms showering on its benefactor its beauty, its fragrance and its luscious fruit. The man gets not only the material benefits from its ministrations but the love of nature grows warm and sweet in his heart and leads him to reverence that great

First Cause that orders all things in such wondrous harmony and perfection.

I have tried in a general way to give my idea of the possibilities of central Wisconsin in the matter of commercial apple growing. The way and means, the varieties and methods of culture are only general. The detail must be left to individual localities and conditions. Every man who dares attempt the problem must be wise and enthusiastic. He must select varieties and location with judgment as to environment and go forward sure of success if he faithfully performs his part.

In closing let me say that one must not plant in low, poorly drained land. He must not plant in sand or on a gravel bed. He must not smother the roots with a tough sod nor must he plant unhealthy trees or trees not suited to our climate.

Then I say Wisconsin has unlimited possibilities for commercial apple growing under the restrictions I have named in a general way. It is amply proved by the few commercial orchards in our section of the state grown by "The man behind the tree" with his common sense methods and his unbounded enthusiasm for his work.

DISCUSSION.

Mr. Hager: I am going to speak from my knowledge of a little different locality than the Doctor has spoken of. I will speak briefly of three counties that I know of, Outagamie, Brown and Oconto. Where the soil and everything else has been right, it is a little different than it was with the Doctor that planted trees, they did not die. While we have very few commercial orchards in the usual sense of the term, we have hundreds, yes, thousands, of small orchards set out by farmers. Where conditions were right, they grew and they are bearing fruit, and they are growing a great many different varieties. I judged the fruit at the Oconto County Fair one year when one grower exhibited fifty-two different varieties of apples. In Brown county, divided as it is by the Fox River, in most places there is a low, heavy, clay land, it is not the apple country, but going back on the west side to a rolling, hardwood timber land, orchards do very nicely. I say timber land, of course the tim-

ber is removed. On the east side you get back into original mixed timber lands on the so-called ledge or rock formation. It extends farther north into Door county, Mr. Bingham will speak of that probably more particularly. I have been more and more impressed as I see the orchards. I call them Farmers' orchards, they are not commercial orchards, inasmuch as they get but very little returns and right there is where something should be done by this Society or some auxiliary toward the point of getting those men who are producing half an acre to an acre or two acres of apples, raise them in such shape and get them into market so as to get some returns for them. I saw apples last fall sold in the market in Green Bay for twenty-five cents a bushel, and it was more than they were worth, just on account of the way they were handled and the orchard was handled. I just speak of that as work for this Society or some other society to do along that line. In Outagamie county it is largely rolling boulder clay where the orchards have been successful, that is, where the farmers planted orchards usually on those hillsides or hilltops. In Oconto county the orchard region is mostly on soil that has been affected by the glaciers. A loamy soil with a porous clay subsoil. It makes a soil that drains well, gives an opportunity or facility for moisture to work up. On a large area of Oconto county where that kind of soil predominates, it was originally covered with maple, beech and basswood timber. It seems as though orchards do well there, no matter whether on hilltops or sides or on the level. I am interested in three orchards in that county and they are all doing nicely. I want to say one word in regard to varieties in an orchard. I have an interest still in an orchard in Oconto county planted fifteen years ago, planted with about a dozen varieties which I considered hardy, the Northwestern Greening is the only one that has failed to any extent. I think outside of the Northwestern Greening not a dozen trees have died and they have mostly died from splitting down, breaking to pieces. The Anisim this year produced such a large crop that the branches bent over and there has not been a tree split or broken. The Hibernal of course has succeeded, you could not kill that with a club and though it seemed that people wanted to mix their apples, my opinion is that if the varieties could be confined to four, that there would be more money in it for every man that has anything to do with it.

THE PROSPECTS OF COMMERCIAL APPLE GROWING IN DOOR COUNTY AND THE LAKE SHORE REGION.

D. E. BINGHAM.

In Door county, especially the prospects are very encouraging. I speak of Door county because I am more familiar with the conditions here than along the lake shore. Commercial apple growing in Door county is as yet in its early stages of development but what we have observed in the last 12 years leads us to believe that we have some conditions favorable for the production of certain varieties profitably. Our soil being of a sandy loam with lime stone underlying, especially in the pine belt along the east shore of Green Bay allows us to use methods of culture that could not be practiced in some other portions of the state without producing results that might be of considerable damage to the trees. Our soil being to some extent deficient in nitrogen we are not as apt to produce conditions that will cause blight by thorough culture, and our season being considerable later than southern or central Wisconsin we escape the late spring frost with much more certainty than many portions of the state. The large body of ice that forms in Green Bay every winter serves as a check to the growth of vegetation until the season is sufficiently advanced and no danger of frosts.

The late Joseph Zettle of Door county said that he had never lost a crop of apples by spring frosts during a period of 40 years and that in itself is evidence of the influence of the waters of Green Bay on the lake.

In the spring of the year we have considerable cloudy weather and often I have noticed instances where the thermometer would reach the freezing point but from the fact that the sun being obscured the rise in temperature was so gradual that no injury followed. These same conditions prevail in the fall. This fall for instance we had no killing frosts till some time in October, I think after the 10th.

The idea that varieties of apples that are not hardy in southern Wisconsin can be grown in Door county is to some extent a mistaken one. We are obliged to use the same list as

southwestern Wisconsin. It is quite apparent that apples of as high color cannot be produced where the per cent of cloudy weather is greater. The keeping qualities of our fruit produced under such conditions are somewhat enhanced. Ripening later when the temperature is not so high it is often possible to keep them in good condition longer.

The varieties best adapted to Door county and the lake shore for commercial apple culture are as difficult to select as ever and I only know the merits of the few I am growing. That there are others that could be made as profitable I have no doubt. It is not so much the variety in my opinion as it is the thoroughness of the grower to get the variety he is growing to do its best. The Longfield if handled intelligently is a money maker but if neglected is very inferior to many. The Wealthy if allowed to overbear early in life is seriously injured. In regard to the McMahan I cannot say that this tree is inclined to overbear but still it produces a good crop and bears young. The Northwestern Greening is good in many respects and for a commercial apple will go until its quality is better known. The Snow I can find no fault with only that it costs more to produce a barrel of Snow than it does of McMahan. The McIntosh promises to be a money maker along with the Snow. This is about the list I am growing with the exception of Longfield.

Early apples of attractive color can be made profitable in Door county. The Lubsk Queen which only takes about 75 days to mature will always bring good money.

In Door county thorough culture is considered the only method, especially where the soil is shallow. We need all the moisture we can get and cannot retain that moisture without the cultivation. It is true our rain fall is more normal than many portions of the state owing to the close proximity to the large body of water, very often getting showers along the Bay while several miles inland they do not get any.

Considering all the advantages and disadvantages of apple culture in Door county and the lake shore I think the outlook is very good.

COMMERCIAL ORCHARDING IN SAUK COUNTY.

WILLIAM TOOLE, Baraboo, Wis.

Not all of Sauk county is adapted to apple growing, but if all suitable sites were planted to orchards and well cared for there might be many hundreds of car loads of apples shipped from Sauk county in favorable seasons.

Experience has led to choice of clay soil well drained, with slope of ground to north, northeast or east, but there are orchards doing fairly well with some variations from these aspects.

Elevation is considered desirable but there are some very successful orchards near the bases of the bluff ranges, as those of J. Palmer, L. H. Palmer, Robert Ramsey and others.

These have clay-loam soil of the glacial drift and are open to the north, and sheltered by the bluffs from southwest winds.

Extending along the north sides of two ranges of bluffs for a number of miles many orchards of this class might be established successfully. The most important orchards of this class are those owned by the two Palmer brothers who shipped the past season together, about equal to six car loads of apples of their own growing, one car being sent to Virginia with profit. In addition there was a considerable amount of apples disposed of to farmers and in the local markets. Of course it is understood that the apple crop was a light one the past season.

The bluff ranges mentioned are united at their eastern terminus near the eastern edge of Sauk county, and extend westward a distance of between twenty and thirty miles, constituting the quartzite ranges of Sauk county. On these elevated ranges, are many moderate sized orchards, which produce most of years many barrels of apples, which are bought and shipped by those who make a business of shipping apples from Baraboo, North Freedom, Ableman, Reedsburg and La Valle. Among the many orchards on these bluff ranges might be mentioned the Capener, Koepp, and Ringling orchards, near the east end of the south range and the orchards of Bassett, Bellows, Alwin and Karstetter centrally on the same range, Ableman the Terrys and Mash, are some of the or-

chardists centrally on the north range, while further west on the same range are the Foster orchards which were planted over forty years ago and are producing well.

The Hirschinger orchard might be classed with the quartzite range group, being in the same kind of soil although not having the elevation which many of them have. Westward on these ranges are many good orchards, beyond the scope of the writer's personal knowledge. These bluff orchards would average at an altitude of 350 feet above the river in the valley between the ranges.

Another class of orchard sites is found on the terminal and other moraines of the glacial drift and situated mostly between the two quartzite ranges, and terminating about centrally of the length of the quartzite basin, along the eastern edge of the driftless area.

The soil is clayey and to some extent calcareous. The various locations are well drained being at a considerable distance above the ground water, and about 150 feet above the river. All of our leading varieties do well on these soils. Among those having orchards on the sites of this class and situated either north or south of the river are A. Brown, E. Baer, Wm. Toole, H. Simons, Wm. Fox, William Rounds, Franklin Johnson and the Tuttle estate. Extending west and north from the quartzite ranges and beyond some intervening valleys are rolling bluff lands having many good locations suitable for orchards. The best orchard in this range of territory is that of Mr. Thomas Timlin in the town of Dellona, who has about twelve acres of apple trees and sold the past season about fifteen hundred dollars worth of apples.

Along the western borders of our county there is a considerable stretch of limestone soil in which Lime Ridge Post Office is about centrally located. There the young orchards are proving what an experienced orhardist might expect, that a great quantity of apples might be grown in this section. These orchards are tributary to the Reedsburg and La Valle markets and I have not been able to secure statistics of quantities of fruit grown.

Considered from a commercial standpoint Franklin Johnson has found that it has paid to grow the following varieties of apples; Duchess, Wealthy, Fameuse, Plumb's Cider, Fall Orange, Willow Twig, Talman Sweet and Longfield. To this

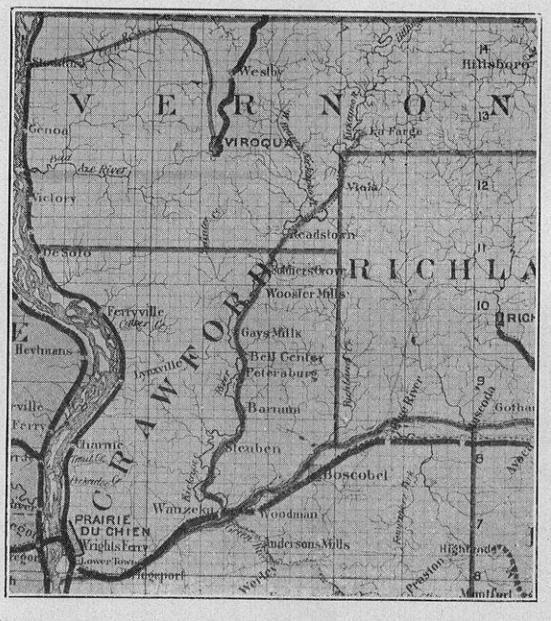
list Mrs. R. Ramsey would add Lowland Raspberry, Wolf River, Patten's Greening, Pewaukee, McMahan, Northwestern Greening and Scott's Winter. L. H. Palmer has found the Utter a very satisfactory market variety and in buying for shipping he finds that in some of the old orchards this variety is doing well and bearing good crops every other year. Some trees of Transparent which had blighted badly a few years ago have since recovered and given paying crops. Newell, Northwestern Greening, McMahan and Lowland Raspberry he would add to the Johnson list.

A. D. Brown champions Longfield and Anisim, but would place Patten Greening with Hibernal. Mr. Henry Simon speaking from the shipper's and buyer's standpoint says that the following varieties take well in the market and are profitable to grow, Lowland Raspberry, Duchess, Wealthy, Plumb's Cider, Fameuse, N. W. Greening and McMahon. Utter is a fine market variety and has done well with some, Fall Orange gives good fruit which is well sought for in the market, but the old trees have not a hearty appearance like those of Plumb's Cider although they continue to live and bear. Wolf River always sells well and would pay if the yield was sufficient. Pewaukee is not popular in the western market. The buyers decidedly object to Longfield and Anisim because they do not hold up well after being placed on the market. Patten's Greening takes well, and Newell has not been on the market in sufficient quantities to earn a reputation. Newell seems to do better on light soil than on clay. The Russets sell well and are reasonably hardy, but are shy bearers.

Talman Sweet sells well but the demand is limited and a large supply would easily overstock the market.

To summarize we might make out the following list of varieties of commercial value for general planting in Sauk County, Lowland Raspberry, Duchess, Wealthy, McMahan, Plumb's Cider, Talman Sweet, Patten's Greening, North Western Greening and Fameuse. Varieties which would probably pay to plant are Wolf River, Fall Orange, Newell, Utter and Scott's Winter. In the fruit exhibit of this meeting there will probably be as usual a good showing of Sauk county apples. Study the fruit display, interview the exhibitors, and be convinced that Sauk county stands in the front rank of the sections of Wisconsin which are favorable for apple growing.

A load of Utter marketed in Crawford Co. from trees twenty-five years old. Not as large as Hood River or Colorado apples but more profitable.



One of the choicest apple regions in the United States. Good apple land may now be had at 30 to 50 dollars per acre. On each acre may be grown 108 Wealthy trees. Millions of people hungry for Wealthy apples. Other regions in Wis. offer equal opportunities. Why leave Wisconsin in order to raise apples?

COMMERCIAL ORCHARDING IN SOUTHWESTERN WISCONSIN.

J. G. BUEHLER, Twin Bluffs.

Commercial orcharding in southwestern Wisconsin is one of the most promising occupations the farmer and horticulturist can engage in for health, wealth and comfort, and it is these three things we strive most for. In locality and climatic conditions southwestern Wisconsin is as highly favored as our sister states, Iowa and Minnesota. We have the soil and elevation for drainage that cannot be excelled anywhere. We also have commercial varieties produced in this state that attracted attention in the markets and won fame wherever they went for color, quality and size. A ready market has increased their demand. With all these favorable conditions shall we stand still or be lagging behind our horticultural brethren just across the Mississippi River scarcely out of sight on bleak and barren prairies who are wide awake to the opportunities and possibilities before them? We can profit by the experience of the past; we have a great experiment station and an efficient state horticultural society to assist us, trial orchards to guide us. Forty or fifty years ago a man would have been called insane had he been able to fortell what has already been accomplished in fruit growing in this northern region. Fortunes are awaiting if we would only grasp them. Duty to our state and nation and the coming generation demands us to be up and doing with a heart for any fate. We ought to be loyal to the future generation as the past has left us free in a land of wealth. Let us look over the hills and see the forest fast disappearing, some necessary for the habitation of man, some just to get it out of the way, leaving the hills bare to drought, and the torrents of rain that sweep the hillsides of their fertility, robbing future wealth. Every land owner ought to be compelled by law to plant a certain amount of trees best suited to his requirements whether fruit trees or forest trees for lumber and fuel.

I have for several years during the winter been heating my house with apple wood by thinning out my old orchard and have been able to reserve my wood lot.

Commercial orcharding in southwestern Wisconson is promis-

ing for several reasons: first, we have the soil peculiarly adapted to apple growing, a heavy clay soil, mixed with lime stone and potash and phosphoric acid lying latent in its soil by centuries of leaf mold and ashes that have been left by forest fire, no need of commercial fertilizer.

In my locality commercial apple growing has proven itself profitable as a vocation or as a side line and will continue to be so if proper methods are carried out. I would not advise a man whose farm consists of rich valley land or low land to plant an orchard. That is the beauty and advantage of the high bluffs of southwestern Wisconsin. Diversity of farming makes it possible to sell the poorer grades at home for immediate use at a fair price. Hundreds of acres of high bluff land in this southwest region could be made profitable if advantageously modified by small areas for the reason that insects and fungi are easier controlled in small orchards than in large tracts in the southern states. We have no need of fear from competition in the markets for size, color and quality but the demands of the markets must be known by the grower that he may grade and pack his own fruit properly to get the highest market price. Nothing is more distastrous to prices than a poorly graded lot of fruit especially in years of large crops.

Wherever a community can grow car load lots some form of organization ought to be exercised for the benefit of all concerned in getting packages and rates.

It is not necessary to give up the portion of land entirely for the orchard. Plant trees wide apart one way to give ample room to raise crops between the rows to feed stock and return nitrogen and humus. I have for eight years been carrying out some experiments in orchard methods in grass culture, meadow culture, alternate and continuous culture and pasturing with sheep. The last named has proven the most profitable and I would recommend it to any man fit for a sheperd for the reason that the sheep are the most economical fertilizer distributers and codling moth destroyers while the wool on the lambs pay handsome profits without much work.

Spraying might be done thoroughly in the fore part of the season with a liberal amount of bordeaux and high pressure machinery decreasing the strength of the bordeaux as the season advances. If we produce first class fruit we can challenge other states which will bring us to notice and our battle will be won.

The President stated that discussion on these papers would be taken up at the morning session.

MORNING SESSION—THURSDAY, FEBRUARY 6.

DISCUSSION.

The President: Yesterday afternoon we had several papers on the prospects of commercial orchards in the different sections of the state of Wisconsin. Now, just for a few minutes we will open those papers for discussion to any one who has anything to say on these locations.

The Secretary: Mr. President, I wanted to say a word or two on that Northern Region. Now, I am compelled to believe all that those gentlemen said yesterday about that country, I do not question their word for a moment, they are enthusiastic over their conditions there, but I do most emphatically protest against this Society going on record as approving of a section so far north as that and advertising it as a commercial orchard region when we have other sections in the state that have been exploited and should be more fully exploited. Now, it may be that there are cherry trees there that were planted at the time of the Jesuits; it may be that there are apple trees there that bear annual crops of fruit and that are apparently hardy, but the stubborn fact remains, that so far as I know, that not a carload, not a wagonload, not a bushel of apples has ever been put onto the market from that country. It is not a question of what they may be able to do, it is a question of what they have done. Now, there are a number of gentlemen here from that region and I wish to repeat that I do not question their word for a moment, but you know as well as I that in the northern part of Wisconsin there are immense tracts of land that are on the market and must be sold, that there are any number of men who are pushing the sale of those lands and who advertise to the fullest extent the possibilities of that region. I have never questioned the immense possibilities and resources of that region from an agricultural standpoint and I shall be one of the first to push it to the utmost limit from a horticultural standpoint as soon

as it has been shown that fruit can be grown profitably for the market in that region. Now, it takes more than one swallow to make a spring, and it takes more than one tree to make an orchard, while there may be trees growing in that region that are perfectly hardy, there is a difference between growing one tree in your back yard and between growing one acre or ten acres for the market. Now, until those things have been fully demonstrated, I protest against the Society going on record as indorsing that as a commercial orchard region. These men have lived there for forty or fifty years, but I speak from a dollars-and-cents' standpoint, before we recommend that country we should be able to say that fruit can be grown profitably for the market and when I say "fruit," I mean always tree fruits. I have no doubt strawberries and other small fruit can be grown there profitably for the market. Now, I would repeat again and I might repeat a dozen times if it would make it of any value, that there are regions in this state where I am absolutely convinced that apple growing can be made more profitable than any other line of fruit marketing anywhere in the United States by growing summer and fall varieties for the great fruit markets of the Northwest. Such regions lie in the western and southwestern parts of the state; that great range of bluffs extending from Chippewa county south, ending at almost the exact northern boundary of Grant county, which includes the famous Kickapoo region where we have established a trial orchard. We know that apples can be grown there, not by the peck or bushel, but by the carload and have been grown and shipped from Richland county by the carload and there is no reason why they should not be shipped by the carload and trainload from regions farther west. It is up to us, to use a common phrase, to exploit that region from the commercial orchard standpoint before we take up the extreme northern region. There are other regions lying in Door county, Manitowoc county and other counties along the Lake Michigan shore that are equally adaptable. Let us develop those and make Wisconsin an apple state.

Dr. Loope: I have some idea in a general way in regard to the region up North. I should differ a little from Prof. Cranefield in this, that if we find that there is a region there which will grow apples, we might develop that at the same time we are doing the other, because we are all over the state now any-

way, and we are in that region, but I was with those who selected the site at Poplar. We believed that that would be as good a site as we could get there. We found certain trees growing and looking well in isolated sections at different places and we selected this orchard site for experiment. We know now that that experiment is largely a failure in one respect, not a failure for the Society. When we are putting our orchards out, we do not guarantee that that orchard is going to do well, we are only going to find out whether it will do well or not. As I say, it is conclusively proved now, without going further, that but very few varieties will ever succeed in the Poplar orchard. We have got to cut them down to a very small number and when we have done that we have eliminated all similar locations. If you cannot grow the apples that we put out there in the Poplar orchard, you cannot grow them in that basin on any similar location, that is my idea. Now, we have another location there, there is no doubt in my mind that the other location is going to prove a better location and will grow more varieties of apples than the one at Poplar, and further than that, in some respects this region that was spoken of yesterday is very similar to this region which we are experimenting with, because that is upon the border of Lake Superior, it is within easy sight of both of those locations.

The Secretary: I wish to emphasize what has just been said. It was said yesterday that this Bayfield region got the benefit of the lake breezes. Now, the Poplar orchard is but seven miles from Lake Superior and the Maple orchard but eight miles.

Mr. Kellogg: Describe the soil, give us the difference between the soil where you are and where that orchard is.

Dr. Loope: As far as I have observed, the soil in that basin at Poplar is a very tenacious, stiff clay, and not only that hard clay, but the drainage is imperfect. That clay lies in layers, you can take it up in layers, and the excessive rainfalls and excessive snows that they have there and everything combines to keep the water in that soil. That is one trouble with the Poplar orchard, that is the poor drainage. That is the main point almost. Of course the winters are pretty severe and the springs are very late, which applies also to the other regions. I have not been through the Bayfield region, but I am satisfied it cannot be different. The same conditions must exist in Bayfield that they have in the Superior region. Further emphasizing

what has been said, there is no question in my mind that in Central Wisconsin there are plenty of locations that are eminently fit for commercial orchards, with the restrictions as detailed yesterday. You have got to have the "man behind the tree" that knows where he is going to put it, what kind he is going to put in, and also he has to look after it after it is put in.

Mr. G. J. Kellogg: If the soil very near the lake on this territory described yesterday close along Bayfield and on the Islands is not better than the Poplar soil, we do not want to recommend it, but it is a fact that they are planting apple trees now there by the hundreds, by the thousands, in that country described yesterday, and it will soon be proven whether it is right or not. If our Society has not a trial orchard up there on that same soil, we had better put one there.

Mr. Riegel: I know something from hearsay of this Apostle Island region and the adjacent peninsula. I have a friend who spends about three months during the summer in that region and he tells me great stories about the cherries. Now it would seem to me if we cannot grow the apple there, that we might boom it as a cherry region if there is money in it, and we heard something read here yesterday which seems to prove that cherries can be grown there. This friend of mine is perfectly in love with the region as a summer resort. I would like to know if the soil on the Apostle Islands is the same as on the peninsula, if it is, then I suppose cherries will flourish there.

Mr. Patten: I should not rise to claim your attention on this subject only from the fact that I have visited that section of Wisconsin and have given it some considerable attention in connection with fruit growing, and also that land has been used to some extent by men who, as I have had good reason to believe, are interested largely in the land question in northern Wisconsin bordering Lake Superior, and for that reason particularly I wish to say a little in reference to that country and for the possible information that I may give to those who have not had opportunity of seeing that country.

As Dr. Loope has said, there is in that northern region bordering on the lake, and I judge several miles away from the lake, that low, flat, cold clay soil, and I found also on Madeline Island, in the south end of that island there is a great deal of that very cold soil, and apple orchards have been tried to some extent on such soil, the hardier varieties have been tried there, and my ob-

servation is this, that I would not plant, nor do I think it would be safe to plant any variety of apple on that character of soil unless it had most excellent drainage, whereas some of the higher portions of the island, small portions of the south end and the northern part have a great deal more sand in the soil; it is underlaid with the red sandstone characteristic of all that region. And so the peninsula. There is a large portion of the peninsula that has high rolling land, with a great deal of sand in the soil and with most excellent drainage, and I have no question but that the hardier varieties of apple will succeed on that character of soil. But it must be only the well-tried northern varieties that a man could plant there with anything like safety. There is one feature that I noticed, and that is that the trees bear remarkably young. They seem to go almost immediately to bearing after being established; they do not put on that vigor of growth that they do in this latitude, or even 100 miles north of this, but they do set fruit buds wonderfully and go immediately into bearing. I think I examined nearly all the older fruit that was growing on trees in Bayfield, and I found such varieties as Tetofsky on the hills, looking very well, and the Duchess of Oldenburg were also found in an orchard that was twenty odd years old, doing very well. Wolf River was growing there and doing pretty well. But as I have said, my observation is that it will require the hardier varieties of trees in any portion of that country to make a success of the orchard.

As to cherry trees that are planted there, I saw the older cherry trees on Madeline Island very close to the border of the lake and there are also cherry trees growing in the village of Bayfield that I should judge were twenty or more years old, and so far as I could learn they seemed to be generally quite successful there. I think it is quite safe to say that on the soil that has considerable presence of sand in it and good drainage along the lake shore—no one can tell just how far inland yet, because that has not been thoroughly demonstrated how far the cherry will succeed, but I have no doubt there is quite a section of the country and a large part of the islands where the cherry would be really a success.

All those things of course must be taken into account, and it is very desirable to grow fruit wherever a farmer settles, but in northern Wisconsin generally my advice would be, from long

experience, to plant only a few of the very hardiest varieties until you can learn just what you can do. Bayfield peninsula is different; one can go into orcharding along the shore there I think with considerable safety.

Mr. C. L. Richardson: I would like to add to the paper which I read here yesterday and say a word or two in commendation of Dr. Loope's remarks on the commercial orchard, that one should have but a few varieties and plant those extensively, and I think that that is being done to a large extent in the Chippewa Falls region. James W. Melville's orchard of sixty acres contains forty acres of Wealthy; then he has three, four and five acres of such varieties as the Wolf River, Northwestern Greening and Duchess, and while he has a large number of varieties in an experimental way, he has a few trees or a few dozen trees, as the case may be, of those varieties. There is but one test that the fruit growers up there apply to any variety, and that is,—is there any money in it? They are not handicapped by any esthetic interest in an apple tree as such, they have no fond memories, so to speak, twining around the trunk of an unproductive apple tree; their question is, "Does it deliver the goods?" and that I think is the true test of a commercial orchard.

One thing more: I did not yesterday speak of the plum, the pear or the cherry, for the reason that the story of the plum, like the celebrated chapter on snakes in Ireland, is very short. There were no snakes in Ireland, and our condition in regard to these other fruits is the same. We have cherry trees there, it is true, several of our growers have planted cherry trees many years back, we have trees there 12 to 15 feet in height and there is not a cherry on them and there never has been. We do not know the reason, but the fact remains. During the last five years many plum trees have been planted of the American variety. They are as yet small and of those we cannot speak yet in a commercial way; the trees are growing, but we cannot as yet apply the test, Is there any money in it, and that is our situation there in regard to these various tree fruits which we are considering here today.

The Secretary: Referring again to the Northern Region I agree with Dr. Loope that perhaps we may be able to develop that at the same time we do the other, but I tell you frankly, and, as it were, confidentially there is an element of danger in going on

record at this time as recommending this as a commercial orchard regidn. There was a time past history when the word of the Wisconsin State Horticultural Society did not amount to much. The time is now when we are a very influential factor in the state, when the word of this Society is worth a great deal to private interests, and there are private interests camping on our trail today, waiting and watching for that word of approval of Northern Wisconsin, and they say broadly, "Northern Wisconsin;" do not say Bayfield peninsula. Now, I speak whereof I know in this matter, and if I could possibly I would make it more emphatic. I will go still further and say, there has been presented to me officially or semi-officially a list of names, the names of men who are said to be the leading horticulturists in Wisconsin who are approving of a plan to push Northern Wisconsin, mark you, not the Bayfield peninsula, but Northern Wisconsin as a desirable region in which men could invest their money for growing tree fruits. In that list there was not a single member of the State Horticultural Society, there was not a single man who had been identified with the fruit interests for twenty years past.

I feel it my duty to make these things known, and I say the moment it will be shown that the Bayfield region actually can yield fruit on a commercial scale I hope the members and every one will get behind and push that region for all it is worth and make it the Eldorado, or the Banana Belt or Fruit Belt of the Northwest, as Mr. Knight has stated.

AFTERNOON SESSION—THURSDAY, FEBRUARY 6.

THE CANNING INDUSTRY.

Dr. T. E. LOOPE.

Dr. Loope was called upon to give information regarding a canning plant for canning the products of a market garden.

Dr. Loope: This question is a little out of my line inasmuch that it contemplates a small canning plant such as would meet

the requirements of a small market garden. Now, it is a very difficult matter for me to take that up. I understand something of the canning business, applied on a commercial scale, something of the requirements, because I have been president of the canning company in our town and have seen the processes and I know something about the processes of canning beans and corn but on so small a scale I could not give anything very definite. I suppose this is to be a commercial plant where the product could be sold and not confined to a family. I will first [illegible] you something of an idea of a canning plant as applied in a commercial sense. Corn, beans and tomatoes can be easily handled in one plant, and the expense of machinery would not be excessive. You would want plenty of power and you would want the right kind of machinery and you want a storehouse to put your product in and in such case I want to say this, that a great many places in the country have canning plants that they would be willing to part with, cheap, and the reason is that some promoter comes along and tells the farmers some fairy stories about what can be done, tells about the great profits and about how easy it is to get the products put up and everything of that kind. They omit one thing and that is, you have to have capital behind the product and not a little capital, not merely capital sufficient to erect the plant and get the necessary machinery and building and the like, but you have to have more if you are going to be successful. You have to have a surplus fund that will enable you each year to buy your product in the raw state, to be able to obtain the labor and pay it promptly and everything of that kind which you can imagine would come with a business of that kind. There is no use of talking, you ought never to go in without sufficient capital, and I say, in a small plant, a plant that can put out 20,000 cases of corn and 10,000 cases of beans and perhaps 5,000 cases of tomatoes, if you can grow them, you would want $20,000 to put up the plant and to carry it through the first year. No little sum, and I am not exaggerating that, I have been in the business and we started wrong and I know.

In the canning of tomatoes, you need, in the first place, a scalder which scalds them to the proper condition, and they go then to the peelers and after they are peeled, they go into the filler, which is not an expensive machine, something like $100, and

from there usually into a steam box, in order to keep them sufficiently to get them so they will cap well, and then to the brush machine, and then to the capper. But before being capped by the machine, somebody has got to put the caps on. There is an automatic capper, but we have never tried that, and he merely puts on the caps as they come from the brush machine and then they go into the capper, which never ought to be less than a Hopkins capper, costing $700. That capper caps them systematically, then they are passed on, inspected. Then after being inspected they are put away. That is in regard to tomatoes.

In corn, you have altogether a different proposition. You have to have corn cutters, in any sized factory you would have to have two or more; two corn cutters would probably cost you $150. Those are attended by men or women, sometimes girls can attend to the cutters as well as anybody else and sometimes better, and from there it goes into the machine that takes out the threads and silk, called a "silker." Then it is deposited in a basin below and there it is taken out by hand, in an ordinary plant, and is weighed and the syrup put in. That is done by one man. It goes of course through the brushes in order to clean it off and it is capped as described in the case of tomatoes. Then it goes to the inspector who inspects it, places it in a crate and that crate then is put into a retort and the corn is cooked under a 10-pound pressure at a temperature of 240 degrees for 65 to 73 minutes, then it is taken out and cooled in cold water in cans and then taken away to the warehouse. There is one thing that I have forgotten, which is very essential, this is the cooker. They call it the cooker where the corn is taken first and brined, it is then put into a cooker and mixer and the temperature there is 185. That is automatic, and the cans come out from below and pass through and are filled at the cooker and filler, and that part of it costs quite a little sum of money, that machine. That precedes the capping and then it goes around to the capper, that is automatic. You can set that cooker and filler to put out about 45 cans a minute. You can run it up higher, but if you do you strain your machine and are liable to get into trouble. You may put it up to 60, and fill a can every second, and pass it along. Then it goes to the warehouse where it is piled and also inspected immediately to see if there are any leaks that have escaped attention.

I want to say here that while corn has sometimes been very profitable and was a good crop this last year for the canner, yet the year before corn fell clear below the producing point. You could buy canned corn for about 45 cents a dozen and you cannot produce it for that, it costs more; you cannot can it for that. You have to pay $6.00 a ton for the corn in the first place and husk it and go through all those operations that I have told you about and it takes considerable help and the whole of it costs you more than 45 cents, you cannot do it. You might possibly get your money out of it at 45 cents, but there is no use of doing business if you cannot make anything on it.

A Member: What should it sell for?

Dr. Loope: You can make a fair profit at 65 cents. We had an opportunity to sell corn at 70 cents and the others did not want to sell. I told them I would not hesitate at all to accept the offer of 70 cents. At that price there was a good profit and you can make lots of money on corn, because you see here is the filler and mixer running at the rate of 45 every minute, you can imagine what you could do then with a double shift. You can figure up very easily with a double shift running day and night that you could put out a large output.

Then in regard to beans, I want to say that beans seem to be the safest proposition of all, excepting peas, and that requires a capital of $75,000 or $100,000, maybe $200,000. With beans, the process is something different. The beans are picked generally by girls and women in the field, and we pay $35 a ton in our town. You have to pay the girls 90 cents a hundred for picking, and you can raise, if you have a good crop, four tons, so you see you will have something for your land and your trouble at four tons to the acre. I raised that and more last year. You cannot always do that if you do not take care of them, but you can raise four tons to the acre and sometimes five if you have the right kind of land and take care of them right. You can make $85 out of that anyway, and that is a fair profit. Plant the same as corn, only closer. The beans come in from the field in sacks, or in any way in which they can best be brought. They are placed on the tables at the factory and there they are snipped. That has to be done by hand, nothing has been a real success in the way of an automatic or mechanical snipper. That has to be done by girls, boys are not

in it. It is a fact, you cannot get boys to snip, but the women will go there and make a dollar a day snipping.

Mrs. Jones: Boys are too slow.

Dr. Loope: It is not that, they want to do something big; they cannot do it, they do not do it anyway and you have to have women. Snipping is the taking hold of the little end of the bean and tearing it off.

Mr. Plumb: What is the difference between snipping and stringing beans?

Dr. Loope: It is the same thing, you do not string them after that. Then they go into a grader, which makes four different grades. The little bean an inch or an inch and a half long is the No. 1, the No. 2 is nearly twice as long, the No. 3 as long as one's finger, and the No. 4 is still longer, and sometimes another grade which is called the No. 5 cut. The little bean sells for $1.40 a dozen cans, the second sells for $1.30 or $1.25, the No. 3 sells for $1.00 a dozen, No. 4 for about 75 cents. The No. 3 should be a long bean, but no seed in it, the No. 4 may have small seed. Of course there is a very small difference between No. 4 and No. 3. They are graded, they have to be sorted by women. Whie the grader does the work perfectly, the machine cannot do the work quite as well as it can be done by hand. Then the big beans, the No. 4, as we have it, are taken to a machine that cuts them through. There is an automatice machine that cuts the beans. They are then put into what is called the "blancher." It is water almost boiling hot and they are dumped into a crate made of wire and left there four or five minutes, then taken to the filler which is fitted for one hundred cans.

Beans are cooked from 18 to 23 minutes under the same pressure and same temperature as corn. Then they are taken out and cooled with cold water in another retort and then taken to the warehouse. You see there are details that you have to have on the several things that you could not get in a small canning business, that is, the steam power and all that. The power to run all this machinery and plenty of steam besides because the storage is made under steam heat and in other places there is steam required. One has to have steam power and one has to have a canning process. I paid $300 to get a secret that is not worth ten cents. If you have any common sense you can make your own brine.

A Member: Do they put any acid in it?

Dr. Loope: Not a thing, only sugar and salt. That is the only thing that goes into that syrup.

Mrs. Treleven: Do you use anything else with the corn?

Dr. Loope: Not a thing else. You are not allowed to under the Pure Food Law. You would not be allowed to use any salicylic acid or any other thing in it.

Mr. Palmer: What kind of corn do you use that you get four or five tons to the acre from?

Dr. Loope: The Evergreen. We put in the early and the late.

Mr. Kellogg: The doctor said he gets four or five tons to the acre, the average yield that the grower gets is two and one half tons or four tons.

Dr. Loope: You have a question that is just that of the "man behind the tree." Some men will take care of the corn and some do not. The man that takes care of his corn, has good soil and good seed can get five tons to the acre, but everybody does not do it, because they are not all alike.

Mr. Andrews: Up our way it runs from about one ton to seven, there is that variation, according to the man that grows it.

Mr. Davis: I would like to ask the Doctor if there is such a thing as getting a plant small enough for eight horse power gasoline engine to run it, for corn or tomatoes.

Dr. Loope: You could for tomatoes run that because the greatest power you have to use there is in the filler and capper.

Mr. Palmer: Do they generally pick all that corn at once?

Dr. Loope: It is not best to do that, we make two pickings.

Mr. Hey: Are there several varieties of Evergreen corn and if so, which is the best variety?

Dr. Loope: There are several varieties. I want to say this that if you buy Stowel's Evergreen from Illinois and bring it up here, it is a pretty late thing. But in two years' time we will get a great deal earlier corp of Evergreen.

THE WINDSOR APPLE.

JOHN HOWIE, Waunakee.

The Windsor (Windsor Chief) was grown from seed planted by the late J. P. W. Hill on his farm on the northern line of the town of Burke, joining the town of Windsor and one mile south of the village of Windsor, Dane County, Wisconsin longer ago than the oldest inhabitant remembers, probably in 1847 or 1848.

He gave the writer a short sketch of its origin saying he brought apples from the East, planted the seed and planted the trees grown from these seeds into an orchard of about two acres, the cultivation of which he took great pride in and was very jealous of parties who came there for scions fearing they would injure his trees. He would not allow me to cut but brought me scions from the Leitch, Windsor and another variety he wanted to bear his name, which he said was a better apple than the Windsor. I have named it Hill's Seedling.

I have been unable to find any other record of the introduction of the Windsor apple from any of Mr. Hill's neighbors as they did not know there was such an apple grown. The late Mr. J. C. Plumb of Milton, Wisconsin is entitled to the credit of propogating and introducing it as an orchard tree and sold thousands of trees all over Wisconsin and adjoining states recommending its merits in the highest terms.

The original Windsor tree was destroyed about 8 years ago while it was vigorous and healthy for a tree of its age as it was probably more than fifty years old.

At our Annual Meeting in 1879 the report says "J. P. W. Hill of Windsor, Dane County, shows some seedling apples called Leitch and Hill's Red Winter, which is believed to be the apple named Windsor Chief, of fine size, excellent quality and very beautiful which promises well for hardiness."

The tree is vigorous, hardy, upright, its only fault being a tendency to twig blight but not enough to reduce its vitality. In productiveness it is equal to any other winter apple. Fruit is above medium, oblate, slightly conical, light greenish yellow, covered with mixed and marbled dull red and russett, fine grained, juicy sub-acid. Season January to June.

DISCUSSION.

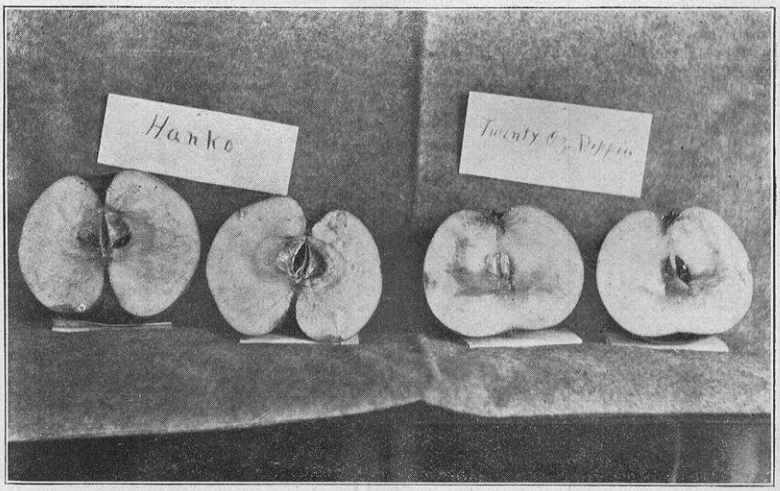
Mr. Buehler: It is five years ago that it was said before the Society that we have not a winter apple in Wisconsin that we could place side by side for a money-maker to compare with the Duchess, McMahan, and Wealthy. I do not know that I can place the Windsor beside them to-day, but we have an apple in that that will keep up until June. The tree is a slow grower, however, I believe that is a good fault in this climate. It has borne annually. I have three trees in bearing in my orchard and I have picked apples from them every year. This last season I picked two barrels and there were scarcely any undersized apples, they run very even.

Mr. Bingham: We have grown it quite largely, the only fault we have to find with it is, it is rather a poor grower in the orchard, that is, it does not attain the size in the same number of years that the Northwestern Greening or McMahan or some of those other varieties do. It is an annual bearer, an apple of excellent quality, a good keeper, the apples are uniform in size. The trees that I have are about eight or nine year old. Under favorable conditions these trees might do much better than they have been doing. We had a severe winter five or six years ago that killed so much nursery stock and so many apple trees in Wisconsin, a dry winter with no snow. The Windsor was injured in the roots considerably, standing beside the Northwestern and other varieties that showed no injury, but I think for southern and southwestern Wisconsin it shows very much more favorably. We have noticed trees right close to Richland Center that showed very little blight, not as much as the Wealthy, and the trees look vigorous and healthy, and it is an early and good bearer.

Mrs. Hey: I would like to ask a question in regard to the Northwestern Greening. From what I have heard here I should judge that you do approve of the Northwestern Greening here, do you not?

The President: I think if you would take a vote of all the people in the State, they would say yes.

Mrs. Hey: We have quite a few planted and so many people in Illinois have been finding fault with it. They say they cannot get perfect apples, that they drop off.



It was suggested at one time that the Hanko and the Twenty Ounce Pippin (not Twenty Ounce) might be identical. A close examination of the illustrations on this page will show that the varieties are distinct. The Hanko is a valuable variety found in western Sauk Co.

The President: I heard J. C. Plumb once say that the Northwestern Greening was pre-eminently a northern apple; when it goes south it begins to fail. I do not know how true that may be, but I would not be much surprised if that is the fact in the case.

Mr. M. S. Kellogg: Has it not been demonstrated by apple growers that the heavier the soil in which you place the Northwestern Greening the greater the success; the lighter the soil, the less the success?

The President: Has anybody else a word to say in regard to the Windsor Chief?

Mr. G. J. Kellogg: I have grown it in the nursery. The only objection I had was, it would twig blight more or less where it was closed in, on open ground there is not much danger. There is not much danger in the orchard. It is not a very rapid grower, as Mr. Bingham says it is a good bearer, a good apple, I have known of its being very successful as an orchard tree. It is hardy enough to go through I think.

The President: The only fault we have to find with the apple is that it does blight in the nursery and it does blight somewhat in the orchard. It does blight severely in the orchard, so that we quit growing it.

Mr. Bingham: I think with heavy cultivation, take it in Richland county, if you cultivate it heavily, it will blight. You have to use different methods of cultivating in heavy clay soil.

Mr. Buehler: Those trees have been in sod ever since I have known them and they have never blighted.

FRUIT MARKETING SESSION.

THE SPARTA FRUIT GROWERS' ASSOCIATION.

MR. B. H. WRIGHT, Sparta.

The question of cooperative marketing of fruits, and the methods of the Sparta Fruit Growers' Association, have been so thoroughly discussed heretofore, that I find it almost impossible to advance any new ideas. But for the benefit of some, perhaps, who were not here last year, I will give a brief outline of our work and its results.

Previous to the year 1906, our Association amounted to but very little, although it had been doing business for about ten years.

It had been able to secure refrigerator cars, thus reducing the cost of transportation; also to gain recognition as an organized company, thus giving material aid to some of its members, who were unsuccessful in dealing, individually, with some of the commission houses.

On the other hand, each member was allowed to practically dispose of his own fruits, either selling directly to buyers on the street, or dictating to which market his product should be sent.

This, may readily be seen, had the effect of over-stocking some markets, while others were left unsupplied.

About two years ago, a number of our most extensive fruit growers decided that some effort must be made to improve the conditions of marketing our small fruits, especially strawberries; as the acreage was steadily increasing, and the price was just as *steadily decreasing*.

Accordingly, at the next annual meeting, every effort was made to get out as many members as possible, and the Association was re-organized upon an entirely new basis, with a capital stock of $1,000 and a membership of 140.

A set of iron-clad rules were adopted, which have been rigidly enforced; and after a trial of two seasons, the Association has

proved a grand success, with very little dissatifaction among its members. The officers consist of a president, treasurer, and six directors, who elect a manager and secretary. The manager, practically, has charge of the entire business. All fruit is turned over to him, who places it where he sees fit, always taking care of the order trade first.

Any member, knowingly violating these rules, is notified by the manager that he is no longer considered a member, and his membership fee, which consists of one or more shares of stock, at two dollars per share, may be had at any time by calling at the office.

Our manager aims to keep in touch with other towns and associations, during the berry season; thus avoiding too much competition. He receives, daily, quotations from all the leading markets, and by a little advertising, has worked up a good order business. This branch of trade has increased largely in the last year. A great many strawberries were disposed of in this way; while the orders for cane berries were many times more than our market could supply.

Every grower is given a duplicate receipt for all berries delivered to the association, each day, and their grade. This is a great help to the grower, for, by attending carefully to the next day's picking, he may be able to raise the grade of, at least, a part of his picking, instead of all being marked a lower grade, as before. This grading of our strawberries was one of the first, and perhaps the worst, propositions the association has had to contend with. Three grades were agreed upon by the management, namely "Choice" marked "B," "Extra Choice" "A," and "Fancy" marked "X."

In addition to these, a very few were marked "no grade." These were of the "button variety," and although not a *profitable* kind, will occasionally appear in the market.

For the past two seasons, we have been very fortunate in securing for our grader a man who had the three most necessary qualifications for that position, namely, the utmost confidence of the members; fairness in all his dealings; and good sound judgment of fruits, as he had been educated from a boy up, in that branch of horticulture.

At the beginning of the strawberry season of 1907, prospects were not very encouraging to the association.

The lateness of the season brought the bulk of our crop into market the first week in July.

The brewers had most of the refrigerator cars filled with beer for the 4th of July so we were obliged to send two car loads of strawberries in box cars, to Minneapolis, in one day.

The house consigned to, was notified and unloaded early the next morning, so they sold fairly well on that market; but could have made much better returns if refrigerator cars could have been used, and sent to different markets.

Another source of trouble to our manager,—who, by the way, is Mr. E. A. Richardson, doubltless well known to many of you,—was a shortage in the supply of cases. The association had decided to try the plan of furnishing crates for its members.

Early in the season, the number of acres of berries and their probable yield, had been carefully estimated; but the number of new members and their acreage could not be accurately determined. Consequently, when the crop was all ready for harvesting and cases were called for our supply rapidly diminished. By using some blueberry crates and shipping in some made-up ones, we were able to save our crop.

The quality of our entire crop was generally good, better than the average. One car, containing 720 cases of strawberries sold for $1,425, in cash; the most valuable car of berries ever shipped from Sparta, I believe. Our association handled during the season 30,556 cases of strawberries at an average price of $1.09 per case.

With the coming of the raspberry crop, business had settled down to a normal condition again, and, while the yield per acre was not quite up to expectations the net returns were very satisfactory to the grower. We shipped 3,430 cases of red raspberries at an average of $1.68 per case and 1,628 cases of black raspberries averaging $1.64 per case.

The blackberry yield was light, but quality and price good; the association marketing 7,437 cases, at an average of $1.55 per case, of 24 pts. each.

Besides these, the association handled a few currants, gooseberries, blueberries, and apples making the total receipts for the year $54,160.46 while the expense has been but .04 of this, or about $2,200.

After taking into consideration the amount of business done during the year; we feel that our losses have been small.

One carload of strawberries, spoiled by delay in transportation, about July 4th was paid for, in full, by the R. R. Company; another carload has not been settled for yet; but feel sure of getting something from that. Aside from this, a few dollars will cover all other losses.

Our association has the advantage of shipping over both the "Chicago and Northwestern," and the "Chicago, Milwaukee and St. Paul" R. R's.; the bulk of our business being done over the latter, however, on account of better service to Minneapolis. We also have a good loading shed on that road, where two cars may be conveniently loaded at once.

The O. and C. Department of the express companies has been done away with, as far as the association is concerned. Berries shipped by them were very apt to come in competition with some of our orders, resulting in spoiling the market at that place; hence our orders from there would be cancelled

We think the plan of making up our own boxes is a good one, as we are getting them made up easier and cheaper this year than last.

Since re-organizing the association has gained 100 new members and increased about $10,000 in business during the last year.

In conclusion, experience has convinced us that the co-operative plan, rightly managed, is *the only* way of marketing small fruits in large quantities at the present time; making it possible for the grower to increase his acreage, and still get better prices for his product.

DISCUSSION.

Mr. Parsons: I would like to ask Mr. Wright how many acres of small fruits your Association grows to get the amount of small fruit that you grew last year?

Mr. E. A. Richardson: We sent out postals last spring to the members of our Association and return reports received from them covered about 300 acres of strawberries, about 50 acres of blackberries and about 98 acres of red raspberries.

THE CRANBERRY GROWERS' ASSOCIATION.

MR. A. C. BENNETT, Grand Rapids.

In the organization of a sales company, especially in the fruit line, it is first necessary to select a few leading individuals in that line who, having made a success of the business, are fitted to lead others.

In all organized efforts there are some individuals naturally born to lead and others to follow. If good leaders are selected, success is well nigh assured. The next most important thing is to have something to sell that will be satisfactory to the public after being sold. No association can afford to represent or recommend an article that does not give perfect satisfaction.

In order to establish a good reputation the territory sold over should be limited so that the association can supply all its customers who are willing to pay a fair price for a good article.

When I sold our own cranberries direct to the retail merchants, some of them would say: "Bennett, we can buy cranberries of others for $1 a barrel less than you ask for yours." I said, "I know it, and why don't you do it?" They said, "We have tried it several times and lost money every time by it. There is no use talking for our late keeping berries, we have got to have your berries." Our berries were no better than others, but the care taken in picking, sorting and curing them (the curing process described by me at your last February meeting), was what brought us the extra dollar a barrel and held the trade.

When I left the road as salesman I selected two agents and let my son do the business, these agents working on a fixed price per barrel for their services. They soon found lower priced berries on the market and asked the privilege of meeting competition which was granted; the result was that for several years many of our hand picked, hand sorted and well cured cranberries were sold at the same price as the poorest, dirtiest and meanest raked berries that were offered to our trade but we did not lower our grade and our salesmen greatly increased their sales. Then we called a halt, refusing to make any price in advance of shipping time or to meet such competition, but

before shipping their order would quote them our prices and if not satisfied they could cancel the orders. The result was that we sold all our berries at fair prices.

Now with a successful sales company our berries are sold by the car load to the same jobbers that tried to compete with us with poor berries and they are willing to pay us more by the car load per barrel, than we used to get by the single barrel and the same customers prefer to pay these prices because they can rely on the quality of the berries. A good reputation it pays to keep.

In forming a sales company or a stock company let no one secure more stock than another. Where stock counts for votes it is often abused. Not long ago a man held a controlling interest in a corporation, his son was a candidate for secretary; they were trying to decide whether the salary should be $1,200 or $1,500 a year, when the old man arose and said: "My son shall be secretary and his salary shall be $2,500." Can harmony long exist under such conditions? I know of another corporation, capitalized at $50,000, working harmoniously for years without the issuing of a single dollar of stock where the rich and the poor have equal privileges.

Avoid too many varieties. A friend of mine in Los Angeles, California, showed me his orchard of apples, peaches, pears, oranges, lemons, cherries, olives, dates, pomegranates, persimmons, plums, nectarines, etc., in which no two trees bore the same variety. What association could afford to handle such a lot? Nothing but a regiment of Italians could do it. Cranberries are all packed in uniform sized barrels in Wisconsin, Massachusetts and New Jersey, containing 100 quarts, dry measure. The law also requires a weight of 16 ounces for a quart, 32 pounds for a bushel, or if sold by measure, that it shall be struck or a level dry measure, not liquid measure, which gives only about 14 ounces to the quart.

Grade the fruit. With cranberries we first take out all that will pass through a ⅜ inch screen and call them pie berries and sell them cheap. They are immature berries and will not keep long, but if used when fresh are like young currants or gooseberries, very tender and make nice sauce or pies. By removing these the balance of the crop keeps much better and is worth more money. We make several other grades, all of which go under different brands which are made as uniform as possible.

Anything not up to grade or imperfect is left without brand, and sold on its merits. Every barrel should be hand assorted solid packed and uniform throughout.

Bond every salesman and every officer. Sell the fruit for cash or on some short definite time, never consign it or any part of it; to do so ruins your cash customers, whom you should protect. Require every saleman to sell the goods on the open market for the best obtainable prices; to sell in accordance with the laws of the state where sold and of the United States, and that they shall not enter into any combination with any other parties in violation of such laws, giving bonds in sufficient penalty for your protection.

I was one of the delegates sent by the Wisconsin Cranberry Sales Company to New York last year, with full powers to complete, if possible, an organization which should include the New England Cranberry Sales Company, the New Jersey Cranberry Sales Company and the Wisconsin Cranberry Sales Company. These associations united for the purpose, 1st of securing a more uniform distribution of cranberries at less expense than could be accomplished by the separate acts of each.

2. To increase the demand for cranberries by judicious advertising by united effort which has been done to the extent of several thousand dollars.

3. The "National Fruit Exchange" organized by us in New York, with an office in Chicago, does the selling and collecting for us, but they are not permitted to buy any outside berries or to make any offer on them.

4. Each of the three companies retain their individual existence, distinct and transact their own business. If a member of the New Jersey Cranberry Sales Company put in poor berries, we of Wisconsin and New England have no control over him, but if a member of the Wisconsin Cranberry Sales Company puts in poor berries our Wisconsin inspector and that grower are held responsible and must stand the full amount of the loss.

The National Fruit Exchange like the California Fruit Exchange only sell fruit for our members. We do not buy or speculate in cranberries. We have no price fixing committees. The best obtainable price in the open market is where cranberries are in greatest demand and there we sell. There are many others selling cranberries, one party alone selling about

450,000 dollars worth annually. We have nothing to corner the market with but a superior quality of cranberries. In Wisconsin many of us take out the pie berries, in the east they do not. All Wisconsin berries are sold through the Chicago office and remittance is made direct from that office to each individual grower, except a small percentage retained to cover expenses, officers' salaries, advertising, etc. As soon as a car of Wisconsin berries is sold a duplicate of that invoice should be forwarded to our local secretary, so that we may know to whom it went and where. If complaint of any car is made the party who shipped it should be notified at once also our sales agent or general manager and our local secretary, so that an investigation can proceed at once.

I hope the time will soon come when our inspectors will be appointed by the governor of the state or by the Pure Food Commission, and be regulated by law, so that no one, whether a member of our association or any outsider, will be allowed to sell wet, mouldy or rotten cranberries.

Our general manager and salesman, and bookkeeper,—in fact the whole selling force, are men of long years of experience in their particular lines and not one of them are growers. They were selected for their ability and experience after much investigation, regardless of price; the best is the cheapest in the end. They make for us the money wherewith we pay them. Some foolish growers in Wisconsin had previously started a sales company composed entirely of growers, even to the lawyer who drew up their organization papers. They selected one of their member growers as salesman. They sold about $8,000 worth of berries on which they lost about $4,000, then they went to law to see how the loss should be divided. The suit was carried to the supreme court, after five or six years' litigation, while our salesman sold several hundred thousand dollars worth without a loss of a single dollar of poor accounts, or a single law suit.

There are four classes of people that should not belong to your selling associations:

1. Doctors: If you belong to a successful sales company you will never be sick of it and need no doctor.

2. Ministers: If your sales company dies it will be a clear case of suicide and they can give you no consolation.

3. Lawyers: They live on the troubles of others and make

trouble for other lawyers to live on. If you need legal advice be free to employ the best talent outside and pay for it.

4. Nursery men: You will have occasion to discuss the value of varieties from the sellers' standpoint as well as the growers' and not from the standpoint of the interested nursery man. Avoid them as you would a hornet's nest.

QUESTIONS AND ANSWERS.

Certain nurserymen advise a severe cutting back of root grafted trees at the end of the first year. Is this advisable or advantageous?

Mr. G. J. Kellogg: No. All I have to say is no. If you want a discussion, go on with it.

Does it improve the root system of an apple tree to transplant it when one year old, and will it pay, on a large scale?

Mr. Patten: Not in your northern climate. It would pay in a southern climate, probably, but not in a northern one, as we have all over Wisconsin and Iowa.

Is it safe or advisable to plant southern grown apple trees (N. Missouri) in Wisconsin, assuming the trees to be cut back during summer in order to ripen the past season's growth?

Dr. Loope: I should say yes, if they have not got the San Jose scale.

Mr. Kellogg: Or you cannot get good Wisconsin trees.

Dr. Loope: Southern Iowa, Illinois, Nebraska, Kansas and Missouri can grow larger trees than Wisconsin can and can grow more perfect trees for a two year old and I do not see any reason why we should not plant them.

Mr. M. S. Kellogg: While under certain conditions it may be true that it may be permissible to set these southern grown trees, I believe that a three of four year old Wisconsin grown apple

tree is better for a Wisconsin planter than a Missouri tree, even if you get the Missouri tree at half price.

Mr. Bingham: I believe an apple or cherry tree grown in the southern states is apt to make a success in Wisconsin if the variety is right; if we bought a two-year-old tree in the south, we are apt to get just as good success in northern Wisconsin as we have with a Wisconsin grown tree, other things being equal.

Mr. Kollock: A few years ago I planted quite a large orchard in Colorado, and I bought the trees from southern nursery growers (Tennessee) and the trees were fine and did well when they were set out, and Colorado is not a warm climate.

Mr. G. J. Kellogg: Perhaps twenty years ago I bought 100 Yellow Transparent down in Alabama, I was short of that kind, and I got some trees to set in the nursery and grow. It took me three years to acclimate them in the nursery row, then they were not good for anything, while the Yellow Transparent grown here is all right excepting for blight. While I have been out on this orchard question, the last three weeks, I found almost all the orchards that were set with southern or eastern trees had died out, the Wisconsin grown trees are still alive, some aged twenty, thirty to forty years. There are some pointers. The difficulty with the southern grown trees is, they grow them so quickly that they grow them soft; they are not hardy, they do not bear the winters. If we have a nice winter after they are planted they may escape injury, but a Wisconsin tree of half the size will double the money.

Mr. Knight: I am a layman in this business and seeking all the information I can get, and there is one point I would like to bring up. Take a tree grown in the southern climate, is it not likely to have a more open texture of wood and more susceptible to injury from cold weather than a wood that is grown in a northern climate, where it will grow slower and will be stronger and stand the climate better than the one that is grown farther south? That is the point I would like to have brought out.

Mr. M. S. Kellogg: In regard to the texture of wood, take a man who is in the habit of making root grafts, and he can tell with his eyes shut and without knowledge of where the tree comes from, whether it is a northern or southern grown tree; not only of the scion, but of the seedling also.

Mr. Bingham: We have planted thousands of cherries, all

southern grown trees, and we have excellent success with all those trees; dig them in the spring, plant them out, cutting them back in the fall, it ripens up in the northern climate and is just as apt to live the next winter as a Wisconsin grown tree. We get a tree with better root system at two years and we get a tree straighter, healthier, of more vigorous growth, and by cutting those trees back, in one season we get a tree that is acclimated to our Wisconsin climate, and I have never found any injury from winter killing of those trees.

Mr. Patten: In reference to whether a southern grown tree, for instance, a Missouri or Kansas grown tree is as good a tree as a tree grown on the 43rd parallel of latitude in your state would,—the reason I think that they are oftentimes not as good at two years of age, or at three years of age is simply because they are overgrown for this climate. The cell structure of those trees is much coarser than of a tree grown in this latitude which has grown considerably slower. For instance, a tree here four years of age would not be as large a tree as a tree grown in Kansas at three years of age, and for that very reason, if the winter following should be a very severe one, you would discover that the southern grown tree would suffer more than the northern grown tree. I have demonstrated this, I think, by actual experience and observation. I think there is no question on that point.

Mr. Edwards: From what I heard of Mr. Bingham's remarks, he confines them to cherry trees. Now, anybody that raises cherries in Wisconsin knows that it is a very difficult matter to raise cherries in this state; if you do not believe it, try it and you will find out. But in regard to apples, I certainly endorse Mr. Patten's ideas. We have gone to extremes here on both sides. If a man has well grown trees here, grown in this latitude, or as far south as Mr. Patten is, they certainly are better than southern grown trees. If you do not believe it, buy them and you will find out they are coarser in growth and subject to being killed in winter, more so than trees grown in latitudes within three or four hundred miles of here. I believe that trees that are grown in Wisconsin and in Iowa or Illinois, and well grown, are better than trees grown in Alabama or some other state way down south, that are grown perhaps in a year or a year and a half; these are tender and soft; you know they are pretty nearly soft enough so you can squeeze

them with your fingers. You shake your heads, but you know they are not as hard as trees grown at Sturgeon Bay, you cannot get around that proposition, Mr. Bingham.

Mr. Bingham: When we receive them they undoubtedly are of softer texture of wood, but the idea that I had in this discussion was: Will those trees live in Wisconsin, will they be a success, and while I do not advocate trees grown as far south as you mention, if we can get varieties that are grown there and grown well, we can get them into northern Wisconsin and by one season's growth, planted in the spring, those trees will be acclimated and that tree is ripe enough in the fall, and I found we have just as good success as we have with Wisconsin grown trees, as far as living is concerned, if the root system is not injured by transportation. There is a great deal of difference in the transportation of the tree from the far south, being held in cold storage three or four months, before the planter gets them, and the roots may be injured by the cold storage and shipping, but if those trees are grown near large towns and shipped in excellent condition and planted out, I am of the opinion that they can be made a success to almost as great a degree, or a greater degree than Wisconsin stock of the same variety.

Mr. Plumb: It is generally conceded at this meeting as I understand from the discussion, that southern stock is worthless. With us we have had a great deal of trouble in getting satisfactory scions and bud stocks. *Would there be any objection to getting them in during the year heeling them in during the winter, using those buds and those scions for buds and stocks on trees grown in our latitude?*

Mr. Andrews: As scions I think the hardiness would be in proportion of the size of the scion, to the size of southern trees.

Mr. Plumb: I would like to ask whether the same rule applied and whether it would be advisable to use for scions stock gotten from the extreme north? I am on the 43rd parallel of latitude, 400 miles west of here. Now, if I wanted material for grafting or budding, would it be better to buy of a person on this latitude or one farther north?

Mr. Andrews: I should think a person on this latitude would be all right, I would rather buy from the man farther north than from the man farther south.

The President: When we want to get a question settled definitely, we always go to the professors. I would like to hear from Prof. Taylor.

Mr. W. A. Taylor: I doubt if Professor Taylor is here, I have no claim to that title. But it looks to me, as far as I have had opportunity to look into this matter, it is simply a question of risk, do you want to take the risk, or do you want to reduce the risk? To my mind there is no sound principle in the selection of trees for planting, or, I would put it the other way, the safest principle in the selection of trees for planting anywhere is to get trees grown under conditions just as near the conditions that you have as you can get good, sound trees. I would not hesitate a moment to go south for a sound tree, if I could not get a sound tree grown nearer by, but if I could get a sound tree grown nearer by, I should stop there.

Are bees a necessary adjunct to fruit raising?

The President: It used to be said that we could not grow fruit without bees, now we know better, I think, because there is not a swarm of bees within five miles of us that I know of.

Mr. Buehler: We have a young man with us who keeps an apiary in the orchard, his name is Reis.

Mr. Reis: I think especially for plums and cherries that the bees are of advantage, they fertilize the blossoms. I think it might be just as well applied to apples to fertilize them and then we do not have to depend so much on other insects to carry the pollen from one blossom to the other. I notice in plums that at any time during the rainy season when the bees cannot work on the plum blossoms they do not set, the same way with cherries, also with apples.

Mr. Hey: I would like to say a word along that line. I have kept bees and watched the working of them. We all know that the alsike clover will produce more seed than any other clover we have. We have grown as high as seven bushels of alsike clover seed to the acre, for the simple reason I think, because the common honey bee can work on this alsike clover and the red clover produces no seed whatever unless there are bumble bees to work it. That has been our experience. I have 600 plum trees and I am going to put a lot of bees right among them this year. We almost always keep a swarm of bees where we grow cucumbers.

Mr. Kollock: In a certain district near Mount Hood, a snow capped mountain, bees do not do well, and the consequence is there are none kept there, but there are some of the finest orchards and most profitable orchards in full bearing that I ever saw. There are no bees there so far as I know. Now, there are some wild wasps, hornets and insects of that kind. Of course they may do some work, but we do not depend on bees, nor consider them essential.

Mrs. Jones: I would like to make a suggestion,—in the clover blossom the pollen is down in the blossom where the wind cannot get at it very well, but in the peach and plum and apple blossom the pollen is exposed and the wind can carry it and that might be an explanation.

The President: I know it is possible to grow strawberries, apples and plums where there are no bees.

Mr. Ray: I keep a few bees and I find that the bees work on plums, cherries and raspberries quite extensively, but on apples and strawberries I very seldom find bees. Among cucumbers and melons they work very strongly.

Mr. Howie: I keep bees, grow cherries, apples and plums. The apples do very well, but the last few years I have been unable to grow cherries or plums. I do not know whether the bees did not do their work, or what was the matter.

Mr. Taylor: That is one of those questions that you cannot answer either way and have your answer right under all conditions. It is a question, in the first place, whether there is some other insect in the community that will carry such pollen as has to be carried. Of course with the plum it is pretty well established that the plum is easily pollinated by wind pollination. In the case, however, of pomaceous fruits, the pear in particular and apple, so far as it has been studied, there is little evidence of wind pollination, the pollen transfer actually taking place through the agency of some insect, and the common bee having been in certain cases that have been observed the insect that did the work. To the question, therefore, whether bees are necessary, I should say it depends upon whether there is some other fellow already there whom you do not have to pay who is doing the work. Then there is this other factor that comes in, and it was very conspicuous this past season in those districts where the margin between setting of fruits and non-setting was narrow. In certain cases in the Ben Davis apple

belt of Southern Illinois which I had opportunity to observe in August when the crop was on the trees, it was very noticeable that the Ben Davis apples that were there, there were not many of them, but those that there were, were where the Ben Davis trees were mingled, where the trees were adjacent to other varieties, such as Jonathan, Aiken, York Imperial, Grimes Golden, Willow, Rome Beauty and Winesap. Ordinarily Ben Davis is sufficiently productive, they are even in large blocks; this year Ben Davis was caught in full bloom by frost the 13th and 14th of April and the blossom crop pretty nearly destroyed and it was a question of either pulling through a few blossoms or not pulling through any, and it is in those cases that the importance of cross pollination comes out, and let me say right here, that whether bees are necessary, or insects, with the pomaceous fruits so far as we know depends entirely upon whether cross pollination is necessary. It has been proved in the case of the Bartlett pear that cross pollination is an advantage, it has been proved at the same time that it is not always necessary that blocks of 10,000 Bartlett pear trees under certain conditions as in California, and quite large blocks in the East under favorable conditions of vigor and favorable conditions at blooming time, set crops without cross pollination. Where the conditions are adverse, as they were down in the orchard at Jamestown, where the discovery was made by Mr. Wait of the Department of Agriculture, Bartlett set nothing without cross pollination, so it is a question the solution of which depends on conditions.

Is a shelter belt a damage to an orchard?

Mr. M. S. Kellogg: I do not know that I can give any light, except to tell the practice of one of the residents of our county, some eight or nine miles east of Janesville, whom some of you may know, Mr. Robert Milburn, who is quite a breeder of Shetland ponies and who has set quite an extensive orchard and in that orchard he has set evergreens among the apple trees, and while I do not know whether they have caused his trees to produce any more extensively than they would otherwise, he has a good apple soil, being on a limestone ridge and rather a heavy soil, certainly it has produced fine apples and the evergreens have grown so they are now as high and in many instances higher

than his apple trees and give considerable protection, no question about that, but whether the matter is one of feasibility I would not say, I have not had enough orchard experience to advance an opinion.

The President: The question is whether it is any damage or not.

Mr. Moyle: One of the oldest shelter belts in the state is in Racine, Co., planted by Mr. John Rhodes, about fifty years ago. It was made up of white cedar, arbor vitae and they grew to be good sized trees. Mr. Rhodes told me a few years before he died it was of no value whatever, in fact it was a damage to his orchard. Now, to plant a shelter belt of shade trees on the west side of your orchard to protect from heavy winds I think would be advisable where we have strong winds, but to plant evergreens, especially arbor vitae, has been found as a rule conducive to blight, and I think most of you will bear me out in that.

I have been in Mr. Rhodes' orchard and observed the effect and the trees blighted badly while in neighboring orchards, where there were no shelter belts they did not blight at all.

The President: I have in mind two orchards, one of them has no protection from a shelter belt whatever, the other one just across the fence had a row of Lombardy poplars planted four or five feet apart as a shelter belt, that was on the west side and north side. In the orchard that had the shelter belt I do not think there is a live tree today, the trees have blighted to death, and gone to pieces, while the other on the west side without any protection whatever is thrifty today. I do not know whether it is due to the shelter belt or to some other condition.

Dr. Loope: I think we are up against the same proposition that confronts us all the time, and that is that you have got to select your location first before you can say whether there is going to be any damage. In a high location where you have a good circulation of air, the belt might be of some use, but take it in any location where the circulation of air might be impeded too much, you know very well that if you get that condition your trees are going to suffer.

Mrs. Treleven: We have had experience both ways. My husband thought years ago he must have a shelter belt for his orchard and he planted one, and I know that the trees did not do as well as those that were planted right out in the open field

and had no protection at all. The trees were all planted at the same time.

Mr. Andrews: We consider a shelter belt on the south good, because the south winds have a tendency, being warmer, to dry the atmosphere. If the shelter belt is on the north, we consider it a damage. A shelter belt on the south will keep the ground more moist and hold more of a layer of snow in the winter if there is any snow on the ground.

The Secretary: Prof. King is here, and I would be pleased to hear from him on the subject.

Prof. King: As the gentleman on my right has just said, this is a complex problem and cannot be answered except you know the conditions of the specific cases. Now, in the case of Lombardy poplars where they are used for windbreaks, those of you who are familiar with the rooting of the tree know that they have a habit of sending their roots very long distances, very close to the surface so that they sap the ground very badly through a distance of perhaps two rows of apple trees and positive injury will come from the tree from the standpoint of feeding rather than from the standpoint of its influence as a windbreak. Of course the shelter belt has its effect not only on the winter temperature, but its effect on the summer atmospheric conditions as to evaporation. It seems there is no question but that the shelter belts diminish the evaporation, the loss of moisture from the orchard, loss of moisture from the foliage where the winds pass first across the shelter belt. That we know from positive observations, that is very effective in the sandy parts of our state in preventing the loss of crops early in the season from sand storms. They have the effect of drifting the sand, not only the drifting, but they prevent the drying out early in the season for quite a long distance away from the shelter itself.

Mr. Palmer: My orchard is protected on two sides with timber. I have been cutting that away on account of the fact that I found around that near timber the gougers were pretty sure to get my apples if I did not clean up the leaves and burn them, so I have been cleaning them up for a strip around there and getting it out of the way. I think such belts would have the same tendency to protect the gouger,—that I think is the worst enemy we have in our country.

Mr. Post: I wish to give some of my experience up in the southwestern part of Dane county. I set out quite an extensive

orchard there. The locality was not very favorable, and I thought it would be necessary to have a windbreak on the north side. The land sloped to the northwest, it was not a very favorable location. The soil was very heavy and the stones among the soil were still heavier, in some places I had to use the pick to dig out the stones and fill in with loose ground to set my trees. I claim that the windbreak or shelter belt that I put there of maple and box elder was a damage. Not only that, but also the oak trees and shrubs on the east side across the road even were a damage, for the reason that those trees near that shelter belt, as you call it, were not nearly as hardy as those that stood in farther. I had another small orchard that was also planted along near the ravine, about fifty trees. That ravine was covered with oak and wild grapes and some wild plums, I thought I would let it stand; I found one row of trees, that is the first row was not as good as the second row of trees.

Mr. Toole: In the spring of 1864 we had a field across which there was something corresponding to a shelter belt, and I was quite surprised to find that the corn for several rows not far from that shelter belt was cut clear to the ground by frost while the rest was only nipped and on close observation you will find that the shelter belt stops the air drainage. Where there is no air drainage, you will find the lowest temperature in the winter and such location is more subject to frost than where there is a free circuation of air and there is one reason why a shelter belt will cause damage where you expect it to be beneficial.

Can a common birch be successfully grafted with scions of cut-leaf weeping birch?

Mr. Moyle: As a rule it cannot successfully be done. It can be grafted and made to grow, but not successfully. The European birch is used more successfully. The cut-leaf birch is very seldom grafted anyway, it is propagated from the bud.

Do we need Pyrus Baccata roots for Wisconsin apple trees? Will any other crab seed do as well as the little Siberian crab for hardy roots?

Mr. Moyle: Sometime ago Prof. Hansen sent me a quantity of Pyrus Baccata to experiment with in my nursery work and I

found that they mildewed very badly. The leaf is of such a nature that on our moist soil in this state it is a failure and I would not advise using it.

Why do the birds take all our Early Richmond cherries and leave the later ones?

Mr. Chappell: Because when the early cherries come there is no other small fruit and they are hard up for something to eat and when you have other berries they leave them and so you save a part of them.

The President: There is another good reason. Is it not a fact that the Early Richmond particularly, if there are any cherries on the tree, they are on the outside of the foliage, while in the later cheries, the Montmorency particularly, the cherries are covered up with the foliage more.

Please name the best five hybird roses.

Mr. Moyle: If I were to have my pick I would have General Jack, Magna Charta, Paul Neyron, Mrs. John Laing and Margaret Dixon. That would be one white, two pink and one red.

Mr. Kellogg: I agree on two varieties, General Jack and Magna Charta and add Madame Plantier and Marshall P. Wilder and Clio.

The President: Next is the best three climbing roses. I do not think we will get very far apart on that.

A Member: Crimson Rambler, Dorothy Perkins, Queen of the Prairie.

Mr. Kellogg: My list would be the same, except Baltimore Belle, in place of Dorothy Perkins. The Baltimore Belle is a better rose, but it is not so much grown.

The President: Best four summer apples, one a sweet.

Mr. L. G. Kellogg: Sweet Russet, Tetofsky, Duchess, Lowland Raspberry, Red Astrachan.

Mr. M. S. Kellogg: I am not able to decide on a sweet apple for an early apple, but the other three would be Yellow Transparent, Iowa Beauty and Duchess.

The best four fall apples, one of them sweet?

Mr. Buehler: I would choose the Fameuse, McMahan and Wealthy, I do not know of any sweet.

Mr. Chappell: I would take Ramsdell's Sweet for the fall sweet apple, a heavy bearer, young bearer and a good apple, good size. I would take the Wealthy, McMahan and Fall Orange.

A Member: Wealthy, Longfield, Patten's Greening and Broughton Sweet.

Mr. Howie: Utter, St. Lawrence, Fall Orange, Bailey's Sweet.

The President: Now, four winter apples, one of them sweet.

Mr. Melcher: I will put in the Talman for the sweet apple in the winter class, Northwestern Greening and Newell's winter, and those are the only two that have given very good satisfaction with me. I do not want to go outside of my own experience.

A Member: Talman's Sweet, Northwestern Greening, Repka Malenka and Walbridge.

Mr. Kellogg: Malinda, Scott's Winter, Windsor, Northwestern Greening.

Mr. Chappell: Paradise Winter Sweet for sweet, then for other winter apples for late keeping, for myself, I would take the Gano and the Salome and Malinda.

Mr. Palmer: Is this for a commercial orchard?

The President: No, it is for good apples to eat.

Mr. Palmer: I would take the Northwestern, Newell, Talman's Sweet and Golden Russett.

Mr. Richardson: The Northwestern Greening, Walbridge, and Newell.

Mr. Howie: Golden Russet, Windsor, Northern Spy and Talman's Sweet.

Mr. Bingham: Windsor and Snow.

Mr. Moyle: I would like to know where Mr. Howie lives, in what part of the state.

Mr. Howie: About ten miles from Madison.

Mr. Moyle: He has given us the best list, taking quality into consideration every time. Somebody here has recommended Scott's Winter, but it is very sour.

Mr. Palmer: I think the Repka Malenka is about the poorest we have in our part of the country.

Mr. Toole: Newell, Westfield.

What is the best method of wintering begonia tubers?

Mr. Moyle: Dig them in the fall and put them into a place where you can dry them pretty well, or if you have them in pots, leave them standing in pots, let them stand until they become dry, then if you have a home out on a farm where you have no furnace, put them in a closet or some place near the chimney where you can hope to keep the temperature so it will not run below 40, even as high as 60, keep them on an even temperature, keep them dry through the winter in nice shape until spring. If you let the temperature get too low or get damp, it will spoil them.

Mr. Elliott: The best way to keep them in the winter is the European system of packing them in cocoanut fiber. I believe that is not used in this country, it is used very much in Europe for packing, and it leaves them in good shape.

Will the yield be improved (in any given area) if two or more perfect flowered varieties of strawberry are planted over the planting of perfect andi mperfect flowered kinds on a similar area?

Prof. Taft: I have carried on no definite experiments, but my belief is that with all plants it is advisable to have several varieties to take advantage of the crossing. I hardly know what the question here means. Now, it seems to me that taking the varieties as a whole, we find the imperfect kinds more productive and except perhaps in cases where we have some very productive perfect flowering kind, I think it would be better perhaps to have one say, good perfect flowering kind planted with one or more imperfect flowering kinds. And so far as the second part of the question is concerned, if two or more imperfect flowering kinds are planted, I cannot see how it would affect the result at all to have imperfect flowering kinds placed together, so far as a direct result is concerned.

Mr. M. S. Kellogg: I would like to ask the Professor a question along the line of perfect flowering varieties when planted with the imperfect, do you think that the perfect flower-

ing variety, would use some of the pollen that is not needed to fertilize its own blossoms and thus add any productiveness?

Prof. Taft: I cannot say that I understand the question, but I believe it is necessary to have a large amount of pollen and as compared wtih a small amount, I think you will get larger and better fruit if you have what you might call a super-abundance of pollen, and I should want to take every precaution to provide that. We may have seasons when even a small amount would give good results, but if we have a season unfavorable for the pollenizing of the flowers, then I would take every precaution to have a super-abundance of pollen present, and I think it is the same in this case as in others where they have been making experiments. They find in tomatoes and other similar fruits, if you call them fruits, that by taking extra pains to pollenize them they gain largely in yield and the perfection of the fruits.

WEDNESDAY EVENING SESSION, FEB. 5.

GARDEN CONTESTS AS A FACTOR IN CIVIC IMPROVEMENT.

C. L. MELLER.

A garden was man's first abode and the memory of that first perfect garden abides with the race seeking expression wherever man finds himself. No nation of any importance from the remotest antiquity to the present but has had its distinctive type of garden. No matter what creed or color the impluse is irresistible to express in a tangible form our dream of the past and hope for the future. None so proud and none so humble, but are as a child in a garden; the king and the peasant are equal here. The world's greatest spirits loved their gardens and found true recreation there; pensive, amidst its busy silent life grief's solace stole upon them unawares. In a garden nature in her happiest moods appeals to man when he is most receptive.

Be it a busy metropolis or a leisurely village nothing improves the appearance of a community so much as well kept gardens for nothing creates a more perceptible sense of refinement nor conveys more firmly the idea of stability and permanency. The philosophy of this is simple. A garden cannot be achieved in a day nor by spasmodic efforts, it is the result of growth, the product of an evolution that is active from the moment that the first spear of grass thrust itself above the ground until the garden is plowed up. A garden is a thing of life where stagnation is impossible, it is either in progression or retrogression and man's intuition gives him to read in each well kept garden the constant unremitting effort necessary to attain the beautiful.

No civic improvement so potent as that which appeals to the individual's pride in himself, in his possessions and in his town. Pride in his garden will develop pride in his neighborhood, which will not be satisfied till his neighborhood conforms to his own ideals. He learns to realize that slovenly surroundings detract from his own best efforts. He becomes public spirited and his garden is his most eloquent speech to his neighbors, giving substance to his arguments. To begin therefore at the back doorstep is to begin at the very foundation of the civic body and whatever is achieved here will exert an appreciable influence and will be of a permanent nature. In a metropolis and more so in a village the garden is the unit and its atmosphere permeates the entire community, so that its appearance reflects in a great measure the appearance of the entire city and vice versa. Averages only are of import here. A city will not take on the appearance of its best garden, nor yet be as slovenly as the worst, but will impress the stranger even as that stranger would be impressed by the average garden.

The child of today is the voter of tomorrow. A more enobling influence could not be exerted upon him than will fall to his lot in a garden. Nature will reach him there, will speak to the child in her language of symbols, which though he can not repeat yet will he understand. Though at no moment conscious that he is learning still the lessons will abide, will grow in meaning as the advancing years help him to interpret them more clearly, and their influence will increase the farther the years remove him from the garden of his childhood. In the garden the young mind is brought into direct contact with nature's mys-

terious ways, cause and effect are ever active before him. In tangible form the results of procrastination present themselves, experience teaches him that seed and harvest time can not be interchanged, and that without an effort nature will yield him nothing. In a garden yesterday was every yesterday and tomorrow will never be today, but now the present alone is the golden opportunity. No matter what the ultimate object, nothing in the garden, no seed, leaf, nor flower offers an excuse for its being, but is there by its own inherent right.

A body of public spirited citizens can find no better means of stimulating civic pride and making their home town more uniformly artistic than by instituting some manner of garden contest. A plan simple enough in its conception but rather more difficult in its execution. To announce the contest in spring and distribute the prizes in fall were somewhat like throwing a cat into a pail of milk so that it may have its fill. Many factors must be taken into consideration. If a village or city is actually to improve the worst part of it must be amended first, a work wherein the obstacles increase with the size of the community. Much will need to be done in the nature of missionary work. Enthusiasm and energy will need to be aroused of sufficient momentum to carry the contestants through the drudgery entailed in the removal of rubbish heaps and the general cleaning up necessary before garden work can even be thought of. In such neighborhoods where a knowledge of nature can scarce be expected, the ignorant will need to be taught and above all a constant source of inspiration must be provided for persistency is not a strong trait in the character of those that dwell in the dirtier sections of cities. But even if nothing more than a cleaning up is accomplished the result will be well worth the endeavor.

All this accomplished there still remains a vexed question. Into the apparently simple matter of awarding the prizes, a phase of the work intrudes itself that gives rise to some perplexities. In every city there are to be found gardens that are the acme of garden craft, little intimations of that first garden that sprang from love, here also the work of love but not unmixed with years of patient work and hard earned knowledge. They undoubtedly should be crowned with prizes. But to award prizes to those whose achievement is the result of years of study and patient work and in itself a great satisfaction to the worker, were hardly

offering adequate encouragement to the strenuous efforts required to convert a rubbish pile into a garden. Of minor consideration though none the less a factor to be reckoned with is to determine who has actually done the work of the garden, whether the contestant himself or paid help. To let the result alone determine the prize winners would handicap the majority at the very outset and it is not human nature to enter a race where the outcome is clearly against the runner.

As the object of our contest is to stimulate an interest in gardening and to bring some semblance of beauty into those places where dirt and disorder hold sway it is evident that other factors than merely appearances must be taken under advisement in the final distribution of the prizes. Clearly the contestants must be arranged in classes. Nor can it be left to the choice of the contestants which class they will enter, but herein they must submit to the discretion of the committee as guided by the qualifications established for each class. In one class excellence of result would determine the winners, while in another class evidence of the amount of work done would fetch the prizes. He with the paid gardener belongs in a class apart from all. By this arrangement the finished garden will stand as an inspiration to the beginner and hold up before him a class into which he can aspire to enter, yet will that gardener also receive due recognition for his years of work.

To effectively carry on a contest of this nature it will be necessary to secure the service of some one having a professional knowledge of gardening so that he may the better estimate the possibilities of each place and the more accurately gauge the work done. He could work conjointly with or individually under the instructions of the committee having this matter in charge. It would also evolve upon him to help the contestants by every means in his power especially through the medium of some local publication. By visiting individual gardens and pointing out to all the contestants the merits and defects of each he can be of direct service to many beside the owner of the particluar garden visited.

Some means of marking so as to grade the gardens will have to be devised. For this purpose either letters or a percentage basis might be used, the latter being better adapted to accuracy and to the computing of averages. In that class where perfec-

tion alone is the aim the gardens need to be visited only for final inspection, though greater precision in grading will result where the gardens are visited at the height of summer and again when fall is at its best. This will be absolutely fair to all. As an illustration let us suppose that three of the gardens visited in summer receive a standing respectively of 80, 85, 95, and in fall taking them in the same order they receive a mark of 90, 85, 85. By totals or by averages we find that the garden achieving the highest percentage is not the highest in fall but the one prettiest throughout the summer; likewise a case might be imagined where a garden in uniform beauty throughout the season attains a higher percentage and yet is not as pretty in the fall as its competitor. Thus where the contestants have been visited twice the real merits of the garden can be the better determined. It will reduce to a minimum the possibilities of a slight mishap or passing defect having too great a bearing upon the ultimate result.

The largest number of gardens will be entered in the class where evidence of the actual work done during that season is to be the deciding factor in the distribution of the prizes. Here a thorough inspection in the early spring before any work at all has been done and a careful record of the condition of each garden at that time will be absolutely essential.

In deciding the contest for this class averages are inadequate, for they would not show the improvement achieved, nor in anywise indicate the amount of work bestowed upon the garden, which is the paramount issue here. The actual amount of work done can best be arrived at by subtracting the garden standing in spring from its standing at the final inspection in fall. An inspection in the height of summer will greatly aid the judges in ascertaining more definitely the actual amount of work represented by the garden, for the fall appearance is hardly a sufficient criterion in as much as it may be due in a large measure to the spasmodic efforts of the contestant, who after indolent indifference the greater part of the year makes a final desperate attempt. Where contestants tie for honors a summer record will also greatly facilitate a more accurate decision, for it is evident that the garden showing a uniform improvement throughout the season represents the sum total of more work than its competitor showing a much greater increase in its fall over its

summer mark than the difference between its spring and summer standing. Nor will the most beautiful garden necessarily obtain first place, for it may not give evidence of as much work as one somewhat inferior from an artistic standpoint. Where, however the placing of the contestants into their proper class has been attended to with care and diligence it will be found that the most beautiful garden of each respective class is apt to show evidence of the greatest amount of work. This is one of the very aims of providing classes.

A further object of establishing classes is to give the man of ample means an opportunity to compete without injustice to him that has less. This wealthy class presents a distinct problem. Here money providing an abundance of labor, plants, and knowledege makes every garden more or less a success at the very outset. These gardens need to be inspected but once nor can the winners be picked solely on their comparative merits. Individual excellence must be considered. To be ranked among the winners in this class a garden can not be a heterogeneous nondescript affair no matter how expensive, but must be an artistic unit expressing a definite idea. A garden must not be an incongruous attempt to mix the Italian, Japanese, and English style of landscape art, as is too often met with. It should conform to the limitations or expanse of the ground and above all must harmonize with the architecture of the home. Swiss architecture can not have an Italian garden for its setting, nor yet can a small Japanese garden be used effectively with a large palatial residence. In a word there must be real harmony and repose in the picture thus achieved. Furthermore the gardens to be winners must be adapted to the climate and local conditions, seeming to be the natural result thereof and not a laborious achievement. A grouping of palms and other tropical vegetation, ever so elaborate can not be considered in the distribution of the prizes, because in a northern climate this is but a makeshift and lacks truth. Thus the most influential citizen can be drawn into the contest and their example be an incentive for others to compete and do their best.

The financial phase of such an undertaking can not be ignored. Several solutions present themselves all depending upon circumstances. If the contest is conducted by business interests, such as a seed house or a newspaper then the costs will be their

concern. Where some public spirited organization proposes to conduct a garden contest the ways and means of financing it may prove quite a stumbling block. In this case it might perhaps not be too much to expect the municipality to subsidize the undertaking in a small way. A popular subscription among the business houses of the city, each firm to guarantee but a very nominal sum and to be called upon to pay as much less as the strictest economy will render possible may prove an efficient way of meeting expenses. A registration fee might be charged in which case it would only be fair to demand a higher fee of those competing in the class where paid gardens are permissible. A large sum will hardly be needed. Where the money is raised by subscription it will avoid possible insinuations if a strict account is kept of every penny handled and the books freely accessible to every contributor.

In the congested parts of every city young humanity abounds, ragged and uncouth, though in tendencies neither better nor worse than the average child anywhere. A product of their environment, they must be acted upon through this environment and in conformity with it. Rubbish heaps and manure piles are not conducive to an appreciation of nature. On the contrary all the associations of such a child will tend to instill into his youthful mind a disdain for the finer influences of life as something unworthy of his ambition and fit only for girls and sissies. He will need to be shown the profitable side of gardening. His desire to achieve something big and tangible can be satisfied by helping him to raise vegetables so that he may have an opportunity to outrival his fellows in the bigness of his products. It will arouse his enthusiasm if he be shown how to accomplish something out of the ordinary, nothing so very difficult if he be taught to graft a tomato on a potato and thus obtain potatoes and tomatoes on one and the same plant. With the boys interested in the practical side of gardening the girls will of their own accord take up the culture of flowers. Let it be born in mind that whatever is accomplished in such a neighborhood will have an added value because of the very magnitude of the task.

In contrast with these pictures let me present to you photographs of other neighborhoods where a love of nature is the outgrowth of habitual surroundings. These children need no incentive to arouse their interest in garden work, what they re-

quire is practical instruction in garden craft. They will profit by the lesson for it is their desire to learn. The educational and the disciplinarian value of a backyard is well illustrated in the next two pictures. Here is a solution to a problem that perplexes many a pater familias. With the boy's interest centered in his own backyard the rod will not need to be brought into requisition to keep him off the street. A garden can become an outdoor school for the children where all unwittingly they will be their own teachers. In this instance the boys built themselves unaided a little clubhouse and constructed in front of it a miniature lake, the farther bank of which they planted with woodland shrubbery. Thus and in many other ways that the youthful mind will itself suggest can the children be instructed in their play and be held within bounds without feeling the restraint. Let but the average child handle a plant and its native curiosity will prompt it to find out the name.

A garden contest will tend to educate the individual to a better realization of the opportunities that too often lie unheeded at his back doorstep. The possibilities of the garden as a place to spend the vacation will become apparent as his labors lead the owner to a better acquaintance with his property. Thus in a search for the esthetic a direct saving will result and all the worry incidental to a temporary migration into the country will be eliminated. The air in a garden is wholesome. The necessary manual labor provides as much and as varied exercise as a short sojourn in the country can afford. As an excellent example of this the following pictures deserve attention. Observe how cosily and contentedly one can read in a hammock. No little exercise can be derived from the daily task of watering the flowers. Pushing a lawn mower likewise spells muscular development. Carrying the idea of a vacation at home to its logical conclusion it were not an impossible task to convert a city lot into a small but attraictive park. The sense of possession heightens the joy of being there. No place so small, but will afford a shady nook for a chair, a dream, and a book. Here fruit trees would yield a varied pleasure, sweet scented flowers in spring, cooling shade in summer, and luscious fruits in fall. No better recreation after the day's toil than to while away the twilight hours in light garden work. The following are different views of a garden that is the result of care and at-

tention bestowed upon it after working hours. The vine covered alley entrance, the rustic tea house, whose floor is strewn with pebbles from the lake and the tall trees make a vertitable little park of the place. Lake Michigan but a block away wafts hither the coolest, freshest air to be had anywhere. An old apple tree no matter how unsymmetrical brings with its gnarled and twisted branches a distinct atmosphere into the landscape obtainable in no other way.

The advisability of other ways fo procuring the co-operation of trained services to help the contestants individually is well exemplified in the next pictures. The gardens here are not neglected but opportunities lie unheeded for want of a little knowledge. Wooden fences unless very ornamental in themselves should invariably be screened or covered. An abundance of material is available for this purpose; all the hardy climbers such as Virginia creeper, Boston ivy, hardy grapes, and honeysuckles lend themselves readily to this end, and for quick temporary effects there are the annual vines of which everybody knows a few. Against a fence the colored berries of the bittersweet vine have a pretty decorative effect. Along open fences sweet peas fronted by dwarf nasturtiums, or climbing nasturtiums alone or mixed with the peas would look well. An rregular border of hardy herbaceous perennials running along two sides of a fence and taking in more or less that entire corner of the yard would bring color and beauty into the finished garden.

Where a long stretch of fence is to be covered with vines a monotonous sky line can be avoided by the judicious use of trees, which in many instances might as well be fruit trees. Hardy perennials or an occasional shrub will intersperse well among the vines thus used. Covering the chicken enclosure with climbers would add to biddy's comfort, make her less obtrusive, and vastly improve the appearance of many a yard. A sense of privacy without closeness can thus be achieved. A walk must never be too prominent and should preferably be laid out in curves, provided this can be done without sacrificing directness.

The positive ugliness of a high board fence is often glaringly apparent in an otherwise pretty garden. When it is covered with climbing vines the garden will have a background where now it has an eyesore. In just such exigencies are climbers

most opportune. In other respects the grass carpets bordered with flowers is the safest treatment from an artistic standpoint for a very small yard. The decorative value of the common sunflower is accentuated in the next picture, where however an opportunity for the effective use of vines has been but partially recognized. At times an old tree stump will challenge the gardener's ingenuity to make it appear less an intrusion and more an integral part of the garden. The best way to treat this where to grub it up entails too much work is to regard it as a rockery and cover it with ferns, hardy grasses and trailing plants.

Asters are well adapted to screen a low fence, affording in fall a bank of brilliant color with which to end the seasons floral display. Golden rod is also pretty, but should be used with care for yellow is not a color that will harmonize well in random combinations. Where a fence is a necessity the endeavor must be to render it as inconspicuous as possible. This can be done as already stated not only with a great variety of vines, but also with numerous species of shrubs. A hedge will often prove as efficient a protection as a fence for there are quite a number of shrubs that will make an almost impenetrable barrier, which could be further strengthened by running wire through it. Where a hedge is not wanted or a fence already exists an irregular shrubbery group is a good means of affording a background or defining a boundary.

Wherever possible plant material should be employed in dividing the lawn from the flower or vegetable garden in preference to a stiff and rigid fence. This will avoid bringing a foreign element into the garden. Often a flower border or hardy herbaceous perennials of bushy habit planted at regular intervals along a walk gives a more definite character to a garden. Where board walks are laid grass should never be allowed to creep in among the cracks, it looks slovenly and unkempt.

A garden to be restful and pleasing must avoid sudden transitions that create harsh contrasts and grate upon our sense of fitness, as when a lawn comes to an abrupt stop and the bare ground of the flower or vegetable garden is all too conspicuous. Sweet peas or any other annual vine trained on a simple trellis provides a ready means of overcoming this defect, which can also be obviated by planting in such places a border of tall bushy perennials or an irregular shrubbery group. Bush fruit would serve a double purpose here combining beauty with

utility. Advantage should be taken of a wire fence as a convenient trellis for a riotous profusion of annual vines.

None the less prominent for being accidental the esthetic will often be found combined most happily with the useful in many back yards. A row of currants affords a pleasing background for a row of nasturtiums in front, at the same time effectually hiding the vegetables behind them. Many similar combinations of bush fruit and flowers could be made. The useful grape may likewise be handled in such a manner as to gratify our sense of the beautiful. In summer its shade, in fall its pendent clusters of fruit will recommend it. Even in a vegetable garden a tight board line fence need not remain an eyesore. Melon and many other useful vines can be trained against it. The scarlet runner bean with its bright red flowers and tender beans would be especially appropriate here.

In a garden contest instances may arise where it is exceedingly difficult to arrive at a just decision regarding the merits of a contestant. In the spring the condition of the garden may be such as to place it in the class where evidence of the amount of work done is to be the sole consideration. Though the fall appearance may give evidence of a great amount of work the perplexing factor may be the condition of the soil, which in this particular instance was practically all ash. This in nowise detracted from the appearance of the garden in spring and therefore the labor expended upon the improvement of the soil would not show in the difference between the fall and spring standing. Even where an allowance for this and similar factors is to be made, it is well nigh impossible for anyone who has not actually done the work to rightly estimate it. Common garden vegetables can often be used so as to add a distinctive charm to the garden. Ripening tomatoes reddening in the sun against their fresh green foliage that merges gently into the darker green of the grass afford almost as much color as flowers.

Not every contestant will accomplish something. Gardens there will be whose fall appearance turns out even worse than their spring condition would warrant. Here is one. A pleasing prospect for the neighbor, a rubbish pile and the discarded odds and ends of household economy strewn promiscuously about. Too many urchins to one yard and a grasping landlord will thwart the efforts of the most persistent. Being obliged to move your garden two or three times during the season is not

conducive to the best results. The most meager achievement is here deserving of praise.

Human character involuntarily expresses itself in every phase of human activity, to which gardening though the very embodiment of tranquility is no exception. A garden may be the result of indomitable energy overcoming formidable obstacles. It may be a triumph of the will. Imagine the walls of a house and a stone paved alley as the place for a garden. Here is a garden in just such a location. Wall brackets afford room for pots, pans, and boxes wherein garden and house plants thrive and possess an added charm in these surroundings. A parrot brings animation into the scene. And the gardener? A little dark haired and dark eyed Italian matron, who values highly the medal she received in recognition of her work here in the congested part of the city where just such an influence is needed most.

Little homely customs can be connected with the various events of the seasons in the garden, the observance of which will add a joyous interest to our work. Let me tell you of one. Here is a gardener from pastoral England who grows strawberries on quite a commercial scale and each year the seasons first berries are carefully picked into the best dish and offered as a present to his wife. It happens that the ripening of the first berries generally coincides with her birthday, giving him an accurate record with which to compare the ripening time of many seasons back. True to English tradition he attempted to train a peach tree against the wall of his house with but indifferent success.

The next two gardens distinctly belong in the class where comparative excellence is to determine the awards, irrespective of the amount of work represented. Here is a miniature park the result of years of love and patient work. Indeed the owner lives to enjoy the shade of the sapling that he planted years before. A little pathos too creeps in for two of the cut leaved birch that he set out thirty years ago are dying now. The iron dog in the middle of the lawn, the benches and the lawn table, the gravel walks all tend to betray the German nationality of the owner. Reading this man's character as depicted in his garden we would expect to find persistency and a love for order marked traits of his mental makeup, which indeed is true as borne out in his daily life. He is a successful business man. The spring view of the next garden illustrates an odd, some-

what old fashioned, but withal an appropriate treatment of a small space where a large variety of flowers is desired. The individual beds may be encased with boards, bricks, cement or other available material. The fall picture further shows the possibilities of this treatment. The utility and beauty of a leafy screen is here splendidly brought out. Flower beds as a lawn decoration in the hands of an amateur are apt to be badly placed, ill planted and altogether grotesque. Occasionally one meets with a flower bed that is well located and well planted.

It is to be regretted that we do not have a spring picture of the next garden which was at that time but a sunbaked stretch of clay. The judges in last year's Sentinel contest awarded this garden first prize not on its merits from an artistic standpoint, but solely because it represented an amount of work far in excess of all its competitors, the more astonishing when we learn that the gardener is a young matron of sixty-five summers. From a professional standpoint the garden has many defects, among the most conspicuous of which are the forlorn little flower bed in the lawn, the bare fence to the rear and the heterogeneous planting throughout. These however are due to a lack of knowledge and not to indolence. Indeed the gardener's greatest handicap throughout has been her inexperience in ornamental gardening. What she desires are suggestions that will help her in the attainment of a more finished garden next summer. The next picture is that of a garden which was awarded second prize. Though a more finished product artistically, its markings did not indicate an equal amount of work with its more successful competitor. Here the use of morning-glories is an especially happy one; ranking luxuriantly, they cover completely and grow beyond a wooden fence that would otherwise sadly mar the beauty of the garden as a whole. Adding the finishing touches to the garden, they not only suggest an air of completeness but also afford a very desirable privacy. In the words of the owner, they make it possible that:—"one does not have to live with his neighbors." This is a most inoffensive but effectual way of avoiding a gossiping neighbor. The annual vines should, however, be replaced with perennials, preferably a variety so as to bring color and animation into this somewhat long stretch of foliage. The fall effects of the Virginia Creeper and the Boston Ivy would help to prolong the garden's beauty way into fall. Again there is that objectionable little flower bed

lost in the middle of the lawn. A detailed view shows the very good use of seeded annuals.

The third prize was likewise awarded in virtue of the diligence the garden bore witness to. Its main fault, is the bare fence along the alley, which in this instance should be screened with an irregular group of some of the taller growing shrubs, such as lilacs, mock-oranges, high bush cranberries, etc. A frequent defect in many back yards is the promiscuous planting of flowers among vegetables. They are not congenial companions. No matter how small the space they can and should be separated. Where vegetables are the main crop, yet a few flowers are also desired for cutting purposes, these latter can be planted so as to keep the vegetables more or less out of sight. Thus the inevitable ragged appearance of the vegetable beds in summer will be less pronounced or altogether hidden. Where the space is very small, it should never be converted into a truck patch, but rather be devoted entirely to flowers, which after all will afford a greater satisfaction.

The fourth prize, a gold medal, was awarded to a garden that illustrates the necessity of establishing a class wherein gardens that are the product of professional skill can compete, without injustice to less favored competitors. The amount of work that entered into this garden can have no weight with the committee, because there are sufficient means at command to provide an abundance of labor, as well as of everything else essential to a garden. This garden and every other garden in the same class must be judged solely from an artistic standpoint and in as far as it conforms to the ideal, for that particular situation, does it deserve to rank among the winners. Such a planting must conform in character to the architecture of the house, as well as provide for the peculiarities of location.

Where the space to be planted is small the apparent size of a garden can be increased by terracing provided always that all other conditions are such as not to make terraces appear labored and artificial. To elevate the garden a little above the side walk will often serve the purpose of protection and privacy much better than a fence can. It will also avoid the air of aloofness that a fenced garden is apt to create in the minds of others. The slopes of a terrace are a splendid location for ornamental flowerbeds. An opportunity is here provided for the exercise of one's skill in designing intricate and artistic carpet beds, for on

such a slope the entire design will present itself to the observer and from any point of view he will become aware of its scheme at one glance. Such a bed on a level would not appear well at a distance because the observer sees it at an angle and it is only when looking squarely down upon them that such beds have meaning. In this respect a flowerbed on a slope bears somewhat the same relation to an observer as a picture on a wall. Imagine yourself looking at a picture on the floor. Foliage beds on small terrace slopes are altogether out of place. Bushes that have a trailing or pendent habit such as the matrimony vine can often be used to good advantage on the tops of terraces. The prizes available for such a contest are numerous. They should be commensurate to the probable desires of the contestants. In that class where work done is to decide cash prizes will prove most appropriate in as much as they will give to the winner means wherewith to further embellish their gardens which otherwise a necessary economy might not permit. In the class where excellence alone is to count and the owners are at the same time the gardeners, pieces of garden furniture or garden statuary would be acceptable. Nor would cash prizes be out of place here. Properly inscribed medals would do for this and likewise for that class where paid gardeners are permissible. Cups and other similar trophies are welcome acquisitions to the dens of the wealthy gardener. Diplomas of merit should be awarded alike in all classes.

WOMAN'S SESSION, WEDNESDAY EVENING, FEBRUARY 5TH.

A SOUTHERN MESSAGE.

MRS. LEONARD L. KELLOGG.
(Mary A. Moyle Kellogg.)

When your worthy secretary, Mrs. Smith, heard that I was going south on a short trip she asked me to send some greeting from the "Sunny South" to this meeting even if I might not appear to present it. But I wish the south could greet you herself as she welcomes me this lovely January morning with a temperature of 70 degrees, the gentlest of soothing breezes, a blue, blue sky, the exultant happy notes of all kinds of birds and flowers wherever man has cared to plant them.

And a languor of delicious sense of ease steals over one and thus one can partly understand the indolence and slow going habits of the southern people.

I tried to glean some information that would interest the horticulturists of Wisconsin, but on a short trip one doesn't see much and I don't wish you to take all my statements as facts, for they have been gathered from many sources and we might safely apply the old adage. "Never believe anything you hear and only half that you see," for the land swarms with "an host of land agents" and they are a class unto themselves.

Still one can get some reliable knowledge by observation and that is what I will try to give you.

Leaving Chicago we passed through the broad level, black corn-lands of Illinois to St. Louis. Taking a sleeper at St. Louis we did not see much of Missouri, but Kansas appears broad and level with nothing of special interest at this season. About the only differences in scenery being an occasional cotton field and the plodding mule teams. Reaching Oklahoma and continuing south through what are the allotment lands the country is more broken in places but with little timber except near the streams, which timber is mostly oak on which that parasitic

growth, the mistletoe, appears green and bright. The country does not appear "enchanting fair" here as the farms are mostly run by poor people and negroes and the homes are unlovely in aspect, being unpainted shacks with no trees, shrubs or flowers to relieve their desolation.

At the thriving town of Muskogee we stopped and visited a forty-acre apple and peach orchard, the first of note that we had seen. It was in fairly good condition though not properly cared for, and the past season had yielded two thousand bushels of fruit, mainly Gano apples.

The season had been an unusually dry one and peaches and corn had failed but in a favorable year they gather peaches from May to October. The manager of this orchard showed us samples of his two crops of Irish potatoes which we had been told could not be grown and kept. They looked well, though small, but it is a fact that the southern grown "Murphys" do not taste as good as our home grown product and northern potatoes command a high price.

At Muskogee we received the first inkling of a milder climate as the day was warm and sunny and the gardener at the hotel was setting out bulbs and pansies for speedy blooming.

The southern part of the territory is partly covered with timber as is also northern Texas, oak, some pine and the false holly bushes where berries gleam cheerily through the timber. Here also as in Illinois and Kansas are seen the osage orange hedges, in some places the trees dropping their bitter, yellow fruit.

The Red River forms the northeast boundry of Texas and just across the lines on the M., K. & T. route is Denison, an old established city where we laid off and experienced our first acquaintance with a Texas "Norther."

The people of Texas grow tall and stalwart and it needs such to keep their feet in the breast of such a gale. The local paper of Ft. Worth, 25 miles distant, said that never before in the history of the local weather bureau had so many miles of real wind passed the station as on that Saturday and Sunday, the storm attaining its greatest fury at points in Oklahoma. We encountered high winds afterwards in all parts of Texas except the coast districts. They are disagreeable to say the least and a sore point with many of the Texans.

While at Denison we visited the nurseries of L. V. Munson & Son and the Texas Nursery Co. at Sherman, a nice town, ten

miles distant, connected by trolley. We found them in the midst of their packing season which continues till March 15th.

Munson is a grape man, especially and his hybrid "post-oak" varieties are recommended throughout the state. These nurseries carry apple, pear and peach in addition to the semi-tropical stock and the evergreen honeysuckle and Magnolias give an air of life to the fields that is absent in the stark, bare plants of the northern states. Here canna and dahlia roots live over the winter in the ground, but roses kill back just as in Wisconsin. There is much more fruit in this section and at Whitebro there is a 500 acre apple orchard just coming into bearing.

We journeyed west from Dallas and Ft. Worth, two of the largest cities of the state, to Abilene, which is on the edge of the elevated plateau and in the semi-arid belt, almost located in the geographical center of the state. This is a day's journey through a most barren tract of rocks, sand, cacti, sage, bush and mesquites.

But we emerge from the waste lands about thirty miles from Abilene and come upon a better looking country while the city of Abilene itself is a clean, hustling little place with many beautiful homes.

The State Horticultural Society and Nut Growers Assn. held a joint mid-winter meeting there and while the attendance was not large, there was much to interest all present and a good exhibit of nuts, fruit and garden truck. Most of the apples were from outside the state, but southern Texas presented some fine Japan persimmons, kumquats and oranges. The improved Japan persimmon is as large as a peach, looks like a plum and to my hostile northern palate tastes like raw pumpkin smells, though there are others that differ with me. The largest and most interesting stand was of seedling soft-shelled pecans. They are hardly recognizable with the hard-shelled red nuts we buy in the north. This nut grows wild along the river bottoms, the tree being similar to a hickory, rather more loosely branched, growing tall and well shaped if allowed room enough. The seedling tree bears at about 15 years, but the propagators top work the trees and they bear in eight or nine.

The improved nuts are worth 25 cents a pound and about forty pecans make a pound, trees yielding from one to four bushels. They have a shuck just like the hickory nut, but are almost all solid meat.

Much time was taken at the meeting in demonstration of budding and grafting, but to go into details concerning this would be tiresome.

This section was new and the fruit industry is only at the beginning, yet even with their light rainfall apple, pear and peach thrive and one five-acre, two-year-old peach orchard we visited was as fine as could be seen anywhere. This was an experimental orchard of the Abilene Nursery Co.

Besides this they were experimenting with grapes, plums, shrubs, roses and all kinds of nursery stock in other plats that people might see what could be grown to advantage there. The president of this nursery company, Mr. Batjer, told us that apples and grapes were affected by root fungus in that immediate section but the high altitude kept the pear practically free from blight.

The people there seem to think that the section has a bright future before it in the fruit industry, and the "25,000 Club" was booming Abilene for a little more than it was worth we thought.

Here, as in most other Texan towns, were seen the cotton warehouses and the many bales of cotton strewn around.

Continuing south to Galveston we here first saw the flowers in bloom in abundance, yet they had had a hard frost a few days previous which was unusual for them.

The flowers grow to perfection in these coast sections throughout all but a short period of dry hot summer. The plants are never retarded in their growth and lovers of flowers may here revel to their hearts delight.

A flower of commercial value is the Cape Jessamine. These waxy fragrant buds are shipped to all points of the U. S., having great lasting qualities. A moderate sized bush bears about seventy-five cents worth of buds a season.

Between Galveston and Houston lie large tracts of rich lowlands which are being developed into the garden plats of Texas. Here will grow most anything the sun smiles upon, Satsuma oranges, Magnolia figs and garden truck taking the lead just now.

But the farmers have much to contend with in the lack of drainage. Strawberry growing has proven very profitable, the berries being ready for picking about February 1st in a favorable year.

Much of interest might be said of the city of Galveston, that island city connected with the mainland by one R. R. track only, to which all lines converge. When one thinks of the "flood" or the "great storm" as they call it there, one hesitates a little, but there are no pessimists in Texas. All are hopeful and inordinately proud of their state and well they may be.

You can find all kinds and conditions of soil in Texas, sand, clay, and black muck and also every shade of these three; and all kinds of climates from the "Northers" to the tropical atmosphere of the southern coasts; and all kinds of people and no one can realize the size of the state till called upon to pay car fare.

From Galveston to San Antonio is a moderate run and this city is well worthy of a visit, being very healthful and delightful in climate and the most historic spot in the state. Here are situated six old Missions and the famed Alamo, the "cradle of Texas Liberty." Here were waged many of the conflicts for supremacy between Mexico and Texas, and the beautiful San Antonio river winds in and around the city making it very picturesque. Here are located hot sulphur wells that are much used by resorters and claimed to be as helpful and beneficial as the "Hot Springs" of Arkansas.

The live oak tree grows here in little groves and one is reminded of the sombre lines of Langfellow's "Evangeline."

"Great oaks bordered the river from which garlands of
Spanish moss and the mystic mistletoe flaunted."

A hundred miles south of San Antonio lies Victoria with an altitude of 88 feet, from which place I have indited this message.

Victoria is high enough to be away from the baleful influences of the very lowlands and yet it receives the invigorating gulf breezes.

Here were seen beautiful roses blooming on bushes like lilacs in size, oranges in bearing and lemons, ripe strawberries and fertile fields that await only development.

And the genial manners and generously expressed kindliness of all her citizens warm our hearts towards Texas and we join heartily with her staunch admirers in saying:

"We are proud of Texas—her resources are unlimited—come and see."

And thus endeth the message.

WOMAN AND HORTICULTURE IN THE FARM HOME

MRS. JOS. TRELEVEN.

Webster tells us that a horticulturist is one skilled in the art of cultivating gardens and horticulture pertains to a garden, he does not specify that it applies to the orchard alone, but to the garden, so it must include the vegetable and flower garden. There is much expressed in the words Farm and Home and I ask what is more to the farm home (aside from good parents and good children) than the orchard, vegetable and flower gardens. With Americans the home idea is not wanting and our home associations are very dear to us, the thought of giving them up grieves us. The farm home is a place where loving natures find opportunity for activity and development, for rest and comfort, when troubled and weary, and for sympathy when sorrowing or rejoicing. The place where true character has birth and education, the nursery of the best life this earth affords.

Gardening or soil culture in the widest sense of the word includes a hundred or more pursuits that call for the thoughtful brain. There is no employment which demands a closer observation nor so fine a sense or more infinite knowledge than the life, growth and habits of fruit, flowers and vegetables. What can be more interesting than a careful study of there revealing to the heart the riches of the vegetable kingdom and watching the growth and development of all life in this great kingdom.

Tilling the soil is one of the most honorable, healthy and desirable pursuits vouchsafed to man. The love of flowers, fruit and vegetables is essential to the highest success. Of all places of man's activity the farm is capable of the most beauty. It is a place for toil but is also an opportunity for the display of taste. The farm is cultivated primarily for profit, for a living. But man does not live by bread alone, he is not satisfied with mere profit, he is an admirer of the beautiful. A farm home is not made so by the labor of a day, a month or a year, but by a continuous effort year after year and certainly the wife and mother ought to be the co-workers in this honorable labor. At the beginning of time man was placed in a beautiful garden and

woman also to be a helpmeet for man. This was the first instance of woman in horticulture and from that time until the present we find women engaged in this work. In these days when year by year woman is demonstrating her equality with man in mental power, executive ability, and business capacity, when women are undertaking so many vocations which were merely pursued by men only and in fact there is scarcely any profession or employment which woman has not attempted with more or less success. Why then is not horticulture a suitable occupation for women? A woman's life began in a garden and history tells us that from the most primitive days of the race, to the present state of civilization, in all lands, woman has been found, either for profit or enjoyment in a garden. Conservative ones among us are still prone to think that for a woman to work outdoors is nothing more or less than a crime, but sensible people are fast coming to the conclusion that there is no reason in the world why the delights of growing flowers, fruits and vegetables should be barred from her (providing she has not too much heavy work to do and has some one to assist her with the digging). A woman can become as accomplished and oft times a more intelligent gardener than a man; and in many countries you will find gardening schools. America is far behind Europe in this respect.

Germany led in this impulse many years ago, and for thirty years horticulture has been a part of the public school system in Sweden. In France there are thirty thousand gardens connected with schools and no teacher is employed who is not able to teach horticulture. In England gardening has become so attractive an occupation to women that some celebrated English horticultural colleges have opened branch schools where they are fitting themselves for professional gardeners.

The average woman is either a bread winner or a home maker, and if horticulture does not appeal to her from a commercial standpoint then the privilege is hers to use it as a means to elevate her home and to educate her children. Household duties should not absorb all the time and strength of the wife and mother; but wherever possible she should secure the rest and enjoyment that is obtained from a change of thought and scene. Educating the child from nature, how can it be better done than on a farm, in the orchard and garden, teaching them to think, instilling in their mind a love for the beauties

of nature. It is a joy to toil among shrubs and flowers and even in the vegetable garden they are constantly drinking in the health and buoyancy from their surroundings. When they are taught to grow their own fruit and flowers they are learning to love nature and it is well known that the early impressions are lasting and many of the older ones will remember instances of childhood, easier than those of maturer years. It is said that a child character forms from the time he is eight years old. It generally develops on the mother to give much of the early training and it ought certainly to be in the power of a sensible and educated mother, to inspire within that period, such taste as shall nearly decide the destiny of the future man or woman. In a cultivation of a love for the pure and beautiful the influence of horticulture cannot be overestimated. The birth place of a great many of our best songs and poems was in some farm home. The influence of these live on and to horticulture should be given the praise. The birth place of many of our great and noble men and women was the farm home and horticluture entered very largely into their early training.

The beauties of our city parks, country homes and many of our farm homes are due to horticulture. If horticulture entered more largely into the makeup of our farm homes their value and beauty would be much enhanced and more homes would be better and happier. The women ought to be the ones deeply interested in this.

In local horticultural societies where they flourish it has been and is largely due to the work, influence and zeal of the women. In our state society, while women have been in the background and have not appeared in a public way, yet much of the work, influence power and achievements of the society might be traced directly or indirectly to the wives and mothers of leading horticulturists.

Let us give all honor to horticulture. To the men in horticulture, to the women in horticulture and to the farm home.

FRUITS FOR THE GARDEN; AND SOME WAYS OF PRESERVING THEM.

Mrs. M. S. KELLOGG, Janesville.

This subject is one of vital importance not only to the women on the farm but to the men also, for as the old saying goes, the way to a man's heart is through his stomach, and if you fail to have that to please the inner man the outer man is apt to get crusty and cross. In the limited time to be given to this subject I shall give you a few thoughts about the different classes and varieties of fruit, and some of the best ways I have found to prepare them for the winter's use. My experience has been more varied than the average farmer's wife and the varieties mentioned are the ones that have proven the most valuable from among the long list of varieties that I have had to experiment with as the wife of a nurseryman and fruit-grower.

Everyone should have a fruit garden and in it should be found strawberries, raspberries, currants, blackberries, gooseberries, cherries, grapes, not to mention apples, crabs and plums. Those living in towns and cities will of necessity be limited as to size, but the farmer should have a large garden and if it is properly planted and carefully tended it will prove the most profitable part of the farm. Those who are limited to small area will find the varieties mentioned here to be the ones best suited for general use from out of a long list of varieties, some of which are good and come are good for nothing.

The tired and overwrought housewife from the hot kitchen where her time is spent most of the day, a few minutes spent in the garden among the berries, keeping down the weeds or gathering fruit for the evening meal will rest the tired body and put the worn nerves back into trim to take up the burdens again with renewed vigor and courage.

The fruit that holds the place of honor, not only in the garden but in the winter's preserves, is the strawberry, the first to ripen, the most welcome arrival and the one which causes the most regrets when it is gone. From among the more than hundred varieties I have been privileged to choose, the Dunlap stands queen of them all, in size, color, flavor and ease of preparation for use. Clyde and Warfield stand second, the former of size and firmness, the latter for color.

In canning all fruit do not make the mistake of waiting until

too late in the season when the fruit is apt to be dry and seedy or past its prime. My method for strawberries is as follows: After the berries are hulled add one-half pound of sugar for each quart of berries and allow them to stand over night if possible; by this method of treatment the fruit absorbs the sugar and retains its shape in the can much better than if cooked immediatey. Six quarts of fruit will need to be cooked about 30 minutes and larger quantities in proportion. For strawberry jam use three-quarters of a pound for each quart of berries; chopped well and mixed with sugar, put on and cook slowly until they are thick. This is not so sickish sweet as when used pound for pound and appears to be better liked.

Raspberries. Take the Cumberland black raspberry fresh from the boxes and pack them into the glass cans, about a quart and a half of berries to a quart can; then place them in a steam cooker if possible, if no steam cooker is at hand use a boiler, filling with cold water to about three-quarters of the height of the cans. It is best to place a board in the bottom of the boiler to set the glass cans on. While the berries are cooking put on one cup of sugar for each can of berries in a kettle with water enough to cover it and let dissolve. When the berries are done, which can be readily determined by running a straw or a fork through them, take them out, being careful not to expose them to a draft, or cool too quickly, fill the cans with the hot syrup and seal at once, being careful that all are air tight. Raspberries prepared in this way will taste the most like fresh berries of all ways I have ever tried. Of the red varieties I prefer the Loudon or Cuthbert as they retain their shape well. For red raspberry jam take any variety of good quality and prepare the same as for strawberry jam.

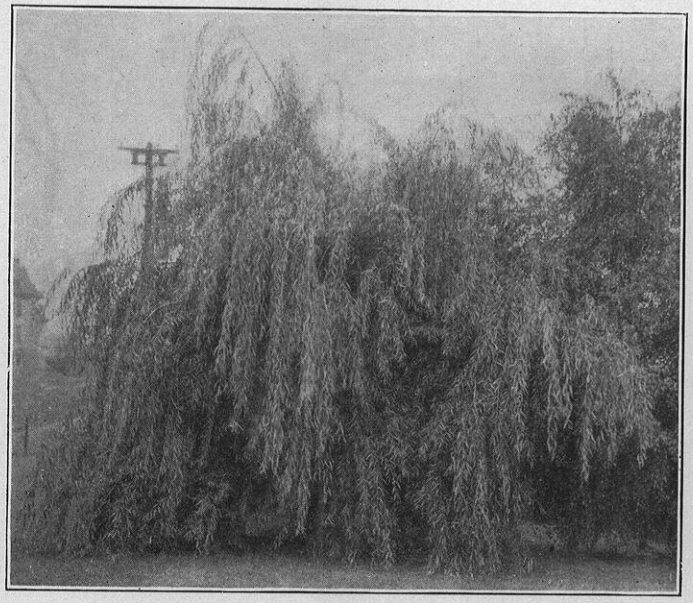
Blackberries. I use the Ancient Briton, using a cup of sugar to each quart of berries, with a little water in the bottom of the kettle to prevent them from burning at first; cook until they are easily pierced with a straw, sealing up hot. This same rule applies to cherries, currants and gooseberries. For peaches and pears make a syrup of sugar and water and cook fruit in this syrup until done, filling the cans with the hot syrup.

Plums. The easiest and quickest way and saves standing over the stove in hot weather, is to wash fresh plums, scald in plenty of hot water until the skin cracks a little and seal while hot. In winter, whenever you wish to use them, turn out in a

kettle (removing the pits if desired), add a little water and a lump of soda as large as a medium sized hickory nut to each quart of fruit, then boil up at once, then add sugar to took like preserves. This rule is especially applicable to those varieties strong in astringency. Another favorite method is to prick the plums with a silver fork and cook in a syrup made of sugar and water until done and seal up hot. For this latter method the Surprise plum excels all others. If one has a limited number of plums and wishes to make them go as far as possible, cook until they are about half done, strain off the juice, add one pound of sugar to each pint of juice and boil down for plum jelly; then take the plums and put through a sieve, leaving nothing but the skin and pit; for each quart of pulp add one and one-half cups of sugar and cook until the sugar is thoroughly dissolved and seal up hot.

Those whose garden is limited as to size will find the Surprise, Forest Garden and De Soto plums as eminently satisfactory for all purposes. The Early Richmond cherry, Wilder currant and Downing gooseberry all head the list in their respective classes. If the price of sugar is high, and this is often the case at canning time, currants, gooseberries and cherries may be canned without sugar, and the sugar added when fruit is used. For pies especially cherries canned without sugar are much more preferable.

There are as many different ways of canning fruit as there are people and there will be until the end of time; to give them all here is impossible. The receipts here given have proven their reliability by years of use, and I hope what has been said will be of benefit to some.



Weeping Willow, a native of Wisconsin.

A further demonstration of the value of cultivation of orchards over sod culture. Northwestern Greening apples, fair samples from two orchards, season of 1907. The one on the right from cultivated orchard, the left from sod orchard. The orchards separated only by a highway. All conditions, except culture, similar.

PRESERVING FRUITS.

A. C. BENNETT.

About forty-two years ago I took my first lesson in the putting up of apples so that they would keep far beyond the ordinary method. I carefully picked the apples and placed them on the top of about ten inches of dry oat straw on the double barn floor where they were left to dry for several weeks in the shade, and where no rain could touch them. When I came to barrel them I noticed that some of the apples had wrinkles on their skins. I put some of these apples into my cellar and sold the balance at $6.25 per barrel to my brother-in-law who was retailing apples in the east. The apples saved for my own use were kept in an ordinary cellar, and showed keeping qualities far beyond anything I ever saw before, and my brother-in-law reported in the month of May, that he never handled such good keeping apples in all his life, that he had some barrels left that were perfectly sound and were never put in cold storage.

In 1893 at the World's fair in Chicago, I noticed the large columns of lemons that were such an ornament to the Horticultural building, and I noticed that they did not rot. I asked the Californian in charge of them how it is that their lemons do not rot? Do you coat them over with white wax, or anything, to preserve them? He replied with a smile and said, "No, they are the natural lemon just as they grew," but he said, "Those of us who understand our business put them in shallow trays like these and just dry them a little, then they will keep, but they don't all do it, they haven't all got onto it yet. Before we did this we used to ship them in iced cars to Chicago and then they had to be sold right off and we often suffered heavy losses on them. Now we save our icing bills, which is quite an item, and the goods don't have to be sold till the market price suits us."

When I went to California seven years ago I found at Riverside a man by the name of Graceland who had printed a little book, and he made me a present of it. He is one of the directors in the Southern California Fruit exchange. This book explained his method of curing lemons so they would keep a year, and gave as his reason for printing the secret that he had

found while he could sell all his cured lemons for more than his neighbors, yet his own product was too small to advance the general price, and that by giving to all a chance to share in his discovery they would all get even better prices than he had been getting. He said before the lemons of California were cured that Sicily lemons were being sold in San Francisco at much higher prices than the California lemons, because they kept better. In Sicily I learn that the lemon is never picked from the tree until it is cured on the tree by leaving it several days when there has been no rain.

Mr. Graceland's method of curing and keeping lemons was to build a square house, with lime plastered walls, inside and out, with a single door for entrance. Outside of this is another building entirely surrounding it, four feet wide with projecting roof for shade, and thoroughly ventilated. In this space the lemons are first placed in shallow trays and thoroughly cured, then removed to the inner building where they will keep a year. I have a cluster of four oranges on a single stem clipped from the tree in California seven years ago, and they are sound to-day, they were simply hung up and dried whole.

We boil down syrup until it is thick and enough to keep. The honey bee does not seal over the fresh honey until it has dried out. Dr. Clark, of Los Angeles, who has a peach orchard, told me that when they irrigate the peach orchard, that for several days after the water has been put on, the peach absorbs so much water that it is insipid until the ground is dry again. The thickening of the juices of the fruit by evaporating of the water not only dries up the stem and retards the entrance of air into the fruit, but it retards the circulation of the juice within the pulp of the fruit, which continues to go on circulating to perfect the seeds within, and the slower this circulation the longer the life principle is maintained. Cold, dry air also retards this circulation, but if made too cold the circulation stops and the fruit is dead, and when warmed up soon goes to decay. Tomatoes may be picked too green so that their seeds will not germinate if removed. But lay the tomato up in the sun and they will soon color up on the outside and mature the seed inside.

Pick the fruit for shipment before it is fully ripe, dry the surplus matter out of it, concentrate the juices to help exclude air, and retard their movement within the fruit, for when the

seeds are matured in most fruits the pulp has served its purpose and is ready to go to decay. Keep the fruit alive as long as possible and thereby retain its flavor.

In the fall of 1901, I sent my daughter a crate of well cured Jumbo cranberries. In the fall of 1902 she sent a small box of them to me in Florida to show me how well they had kept over a year. I had put them in my writing desk in a warm room where they remained until the spring of 1903 when I sent a few of them to J. A. Gaynor, of Grand Rapids, Wis., to be planted on the experiment station, and the balance were sent to Cameron, Wis., to be planted on my marsh there and they came up nicely.

IN MEMORIAM.

J. J. MENN.

Through the death of J. J. Menn the Wisconsin State Horticultural Society has suffered a loss which is keenly felt by the members who became acquainted with him during the years of his active work with the society. His bearing towards his brother members was always kindly and cordial and his pleasant smile, cheerful words and hearty greeting will be sadly missed at the meetings of the society.

He was able to see and appreciate the best in others and his presence was promotive of good will and cordiality.

Mr. Menn was an enthusiastic horticulturist yet always practical and his advice and counsel were received as given by one of good judgment based on experience. His orchard plantings were of considerable extent but I have not learned of the number of acres. Within a few years Mr. Menn brought to the attention of our State Horticultural Society a seedling apple of more than ordinary promise and it is desirable that our society shall see that its merits are not overlooked.

My first acquaintance with Mr. Menn commenced a number of years ago when he addressed our Sauk County Horticultural

Society on the subject of apple culture and the good opinion of him then formed has been sustained by the years of acquaintance which have followed.

Jacob J. Menn was born in the town of Roxbury, Dane county, Wisconsin, October 13th, 1854. A year later he moved with his parents to Monroe county and that county has been his home ever since. On November 13th, 1879 he was united in marriage to Frederica Dreler. Seven children were born, who are all living, Mrs. Klingelhofer who was known to members of this society as Miss Eva Menn, Benjamin and Elmer of Virginia, and Cora, Harvey, George and Myrtle, who are at home with the mother in the town of Sheldon.

Mr. Menn was a man of considerable prominence in county and state affairs. For years he was chairman of the town of Sheldon and a commissioner of the poor under the old system. He was president of the local co-operative creamery which he had helped to establish and was a successful dairyman. He was prominent in church work and an active church official. He assisted in taking charge of the Wisconsin fruit exhibit at the St. Louis Worlds Fair and for a number of years was a member of the executive board of the Wisconsin State Horicultural Society.

Mr. Menn returned home sick from the annual meeting of the Wisconsin State Horticultural Society last February and for some time seemed to be slowly recovering. In a letter which I received from him dated April 4th, 1907, he mentioned that he then suffered from rheumatism but was quite hopeful for the recovery which seemed to be slowly progressing until Tuesday, May 7th, when he suffered a relapse of his long siege of sickness and died Wednesday, May 8th, 1907.

WM. TOOLE.

A. P. WILKINS.

A. P. Wilkins died May 27, 1907, aged 61 years. He was killed by a stump machine, following behind the team, the clevis pin flew out, the sweep knocked him down, and the next time it struck him in the head killing him instantly.

He was a man of honorable repute, a highly accomplished musician, beloved by all, a worthy member of society; he leaves a wife and one daughter.

These facts were given by his Pastor, Rev. R. W. Besworth.

GEO. J. KELLOGG.

REPORT OF COMMITTEE ON RESOLUTIONS.

GEO. J. KELLOGG, Chairman.

The following resolutions were reported by the committee and adopted by vote of the society.

The Wisconsin State Horticultural Society in annual convention assembled, realizing what has been done by other state universities in promoting the study of plant diseases and providing remedies for the same, would respectfully ask that our representatives in the next session of the Wisconsin Legislature be and are hereby requestd to introduce a bill to establish at the Wisconsin University a Chair of Plant Pathology with such provisions and duties as may best serve to put our farmers and horticulturists in possession of the best methods of combating the diseases and insects to which the ordinary plants of cultivation are subject.

(Endorsed by Executive Committee and adopted by Society.)

Whereas our esteemed veteran F. K. Phoenix of Delavan, the oldest honorary life member in our society, who is feeble, now 83 years of age and unable to meet with us!—Resolved that our secretary send him a letter of congratulation.

Mr. Geo. J. Kellogg: Now, I would like to read a little obituary of a man that is not dead. I believe if we have anything good to say of a man, to say it before his death. Two weeks ago I had the pleasure of visiting F. K. Phoenix of Delavan, in his home. On the 3rd of March he will be eighty-three years old. Though he is quite feeble, he is able to walk out, and he walked with me eighty rods over to the old nursery

grounds. It is rather difficult for him to talk, as he has to gasp for breath, but his mind is as clear as it was sixty years ago. I have his signature to go into the volume in connection with the resolution. He has spent his life in horticultural work, the greater portion of it was spent in Illinois. He came west in 1837, I think it was, with a half bushel of apple seeds from western New York. He planted them, went back east and stayed two years in school, came out west and started a nursery. He worked at Delavan till 1854; he was discouraged with the ravages of the oyster-shell bark louse in the orchards of Wisconsin and he went to Illinois where he spent a great many years. At one time he had 600 acres of nursery in Illinois and he had over 400 men in his employ. He is the oldest of our members, and I will now read the resolution.

Motion to adopt resolution carried.

Whereas we all know of the valuable work C. G. Patten of Iowa is doing for the northwest:—Resolved that the president of the W. S. H. S. appoint a committee to confer with Iowa and Minnesota committees to procure some substantial aid in furthering this valuable work. (Adopted)

Office of the Mississippi Valley Apple Growers Association,
Quincy, Ill., Feb. 3, 1908.

To the officers and members of the Wisconsin State Horticultural Society.

Gentlemen:—A genuine interest in all departments of horticulture prompts me to send hearty congratulations to your annual meeting, and earnest wishes for a most harmonious and profitable session.

One of my chief reasons for presuming to send a communication to your worthy organization is to call your attention to the fact that resolutions approving of, and heartily sanctioning the movement, of having the third Tuesday of October observed annually and perpetually as National Apple Day have been adopted and spread on the records of nearly all the national and fruit dealers societies in the United States, and also nearly every state in the apple belt.

The movement was originated, and set in motion three years ago, the New York State Fruit Growers Society being the first

body to give tangible form and shape to the measure by adopting resolutions in its favor. In the passing of three brief years, the most casual observers have seen the great benefits conferred in pressing the wholesome food in more frequent use upon family tables, and in holding the educational features of apple culture in the most attractive and useful light before the people.

Possibly your society has passed a resolution in perfect harmony with expressions of countless kindred organizations in the country. If it has not done so will you kindly take the matter into consideration at the present meeting, and pass a simple resolution announcing approval and co-operation.

I wish also to call your attention to the fact that there has been a concerted movement in favor of making choice of the apple blossom for our national flower. As you well know, we have not at present a national floral emblem. Aside from the apple blossom, the only flowers proposed for the position are the Goldenrod and Columbine. About all that can be said of the goldenrod is that it is a poisonous weed, noted for its peculiar fitness in spreading hay fever; and as for the columbine its suggestion for the place specified seems to have had its source in a sickly sentiment. It should be obvious that in making choice for a national flower we should take a blossom producing a great American fruit, one which makes its force felt at the opening of every season, as it can be plainly seen that it forecasts conditions not only affecting a very important part for farming industry, but also reaching with important bearings through many countless commercial circles.

Hoping that I may be pardoned for this intrusion upon your deliberation, and that you will kindly give expressions that will be in perfect accord with the numerous national, state, district and county organizations that are now working earnestly for the elevation of the apple blossom, I beg to remain with the most cordial and kindest regards,

Yours truly,

JAMES HANDLY,
Secretary.

Resolved, That we concur with the Mississippi Apple Growers Association in recommending that the 3rd Tuesday of October be observed as apple day and further we recommend every ap-

ple grower to supply every member of his family an apple each and every day until strawberries are ripe.

Resolved, That we agree with the Mississippi Valley Apple Growers Association in recommending the apple blossom as our national flower.

(In connection with this resolution a motion by Mr. Toole was carried that our native crab apple blossom be recommended as the state flower.)

Resolved, That exhibits of fruit competing for premiums before this society shall include only such as have been grown by the exhibitor excepting county or other collections of which special mention is made in the premium list. (Adopted)

WHEREAS, good roads are necessary for the successful carrying on and extension of the business of horticulture and general farming in Wisconsin, and

WHEREAS, good roads in all foreign countries and in the progressive states in this country have only been constructed through the aid of the state governments, and

WHEREAS, there is submitted to the people of this state for their adoption, a constitutional amendment making possible the granting of state money to help pay for county roads.

THEREFORE, be it resolved that the Wisconsin State Horticultural Society urge upon its members and the people of the state as a whole the adoption of this amendment, and believes that its passage would result in bringing about the more rapid construction of both roads and bridges. (Endorsed by Executive Committee but due to oversight not presented to Society for adoption.)

Resolved, That the Wisconsin State Horticultural Society in convention assembled, favor the passage of a national law for regulating fruit packing and packages;

That it co-operate with the legislative committee of the national commission to that end;

That each member of this Society enlist the aid of his senators and representatives in Washington for the purpose of securing the enactment of such a law and that these representatives and senators be advised of the passage of this resolution.

(Passed at Summer Meeting, Shiocton, Aug. 28th, 1907, ed.)

REPORTS FROM LOCAL SOCIETIES.

REPORT OF MADISON HORTICULTURAL SOCIETY.

(Organized in 1847.)

E. T. MISCHE.

The organization of the Madison Horticultural Society antedates that of our State Society by some years. Thirty to thirty-five years ago Madison was the objective point of a notable array of personages drawn hither from the whole Mississippi valley to revel in her cool breezes, bask in the warm sunshine and contemplate its enchanting scenery.

European royalty then as now, were deeply interested in the pursuits of gardening, it was a delightful privilege rather than an onerous task to work in the garden. Subjects no less than monarchs themselves indicated a pride in and knowledge of gardening truly remarkable. Small wonder then that the last generation in this country composed as it so largely was of European born and reared element should endeavor to bring with them the acquired tastes and habits of their recent homes. That was a period when Daniel Webster found pleasure and honor in dividing attention between steering the ship of state and broadening and extending the great Massachusetts Horticultural Society, when such men as the elder Parsons, George Ellwanger, Patrick Barry, Thomas Meehan and Mr. Prince were founding the prototype of our commercial nurseries of today.

But the country was new, old world ideas required adaptation, some eliminations and newer ones applied. Most of all the general scramble was for existence—a state always preliminary to advanced horticulture. Hence the pursuit of horticulture was largely confined to grandmother's efforts in tending a door-step garden of old fashioned flowers, or it was purely a commercial enterprise for the rearing of fruits and vegetables.

In the past decade or two our nation has experienced a remarkable prosperity and each year the general populace have means and leisure in greater proportion than heretofore. All this makes for comfort and pleasure and is directly reflected in the share of interest held by horticulture.

Madison is quite typical of this general state of affairs. After a quiescence of some 25 years its Horticultural Society was renewed and each year since has its function broadened and extended.

During the past year the Society's efforts were directed toward the extension of aesthetic horticulture.

With a view to rejuvenating the love of the beautiful, characteristic of our forbears, to spread by contagion the wholesome pastime of cultivating a garden and an intelligent appreciation of the horticultural good things in life—our society planned to crystalize into a working force the diffuse ingredients that together make up horticulture.

Believing that every window displaying a geranium in a tin can, every yard that has turf or flowers or vegetables is overseen by an influence from whence the stability of horticulture springs. Plans were laid to enlist the coöperation of all such to a greater, a combined, and a more telling effort.

Fortunately there was evident the unmistakable sentiment of about a thousand residents who for some fifteen years have been the main stays of the Park & Pleasure Drive Association, and who by voluntary contributions create an annual fund of about $10,000 to carry on the beautification of city and country side. Interest in things beautiful is widely and very generally evident in Madison's citizenship. Our society felt that by crystalizing this diffused interest and giving it an opportunity to express itself in other ways than merely financial contributions would be to the benefit of all concerned. Toward that end the effort was to find just how general and to what extent the general public was interested.

Membership fee in the society was one dollar per year and all members who so desired received a box of annual plants at the proper planting season in the spring. These plants comprised a collection of one hundred of the showier sorts of flowering plants, such as aster, zinnia, etc., also ten gladioli, cannas and one dahlia. A local florist entered into an agreement, to germinate, to transplant, box and deliver to the urban residents

all those contracted for. About one hundred and twenty-five boxes were disposed of. So far as the society is informed these plants gave general satisfaction.

A purse of $75.00 was formed as a prize fund to be distributed for greater improvements in yards. The first was $25.00, two were $10.00 and six $5.00 each, in addition three received honorary mention for the inherent beauty of the grounds. One of the local newspapers espoused the propaganda as its own, conducted the judges over the routes several times, announced the awards and issued a supplement of general interest to the community.

A floral exhibition was held in mid-summer and in artistic arrangement and high quality of material displayed was exceptionally good.

Throughout, the intent was to avoid spreading an effort over too wide a field but instead to feature one or two points and the result has been exceedingly gratifying.

And what, it may be asked, is to be gained, what is meant by the society and what does it expect to accomplish? In answer it may be stated that it exerts one of those silent yet none the less sure and direct influences that breed nobility in life. It quickens the perceptions and significance of the beauties of nature; it is a purifier of mind and surroundings, introducing wholesomeness in the accompaniments of everyday life, the house, the yard, the street, the city, inside and outside. It is the means of sounding the depths of natures laws, in echoing melody of poetry in sky, earth, vegetation and man's handiwork—wherever nature plays a part, horticulture has its counterpart if we will but see it.

To induce a greater, more intelligent, profound and nobler desire in the breast of workaday men, to participate in the pleasures and beneficence of life is assuredly worth while.

The practical application is directed toward bringing the interested ones together and by preachment and demonstration, disseminating information as to means of development.

The trend of the society's efforts are toward a high class development of home estates, general approval of civic authorities toward a substantial and aesthetic municipal construction and an enlightened, progressive and beautiful city generally, be that gained by whatsoever means as within our financial capacity, is possible.

ANNUAL REPORT OF THE LAKE GENEVA GARDENERS AND FOREMENS ASSOCIATION.

HENRY WM. ILLENBERGER.

Mr. President, Ladies and Gentlemen of the Wisconsin State Horticultural Society:

In this, our Third Annual Report of the Lake Geneva Gardeners and Foremens Association, we have much pleasure in offering to you a synopsis of the results of another year's work.

Under the guidance and instruction of such a board of managers, and the co-operation of a large membership, such as the Lake Geneva Association has, we cannot help but succeed.

The first thing in producing wealth and success is the raw material, which is worked up into the requirements of mankind, and which is supplied by nature, under the skill of the practical gardener.

As soon as an obstacle presents itself, it is at once set upon by an ingenious and persevering bunch of gardeners, and annihilated in its initiative.

The officers for the current season include:

President—Wm. P. Longland.

Vice-President—A. Reupke.

Treasurer—H. Wm. Illenberger.

Secretary—Alb. Meier.

with a standing or executive committee of five, on whose shoulders have fallen a very important share of the work.

Our transactions during the current year have amounted to more than $1,000.00, and our treasury at the present time shows a balance of $300.00.

The expenses of the Association are mainly for flower and vegetable exhibitions, horticultural speakers from all parts of the country, delegates to other societies, excursions educating school children in the art of Floriculture, and all other matters pertaining to the interest and general welfare of the Association.

Since commencing the present season, we have held 18 regular meetings, and 5 special, with an average attendance of twenty-five.

The purpose of our meetings are to further the interests of gardening in all its branches. Papers are read on Horticultural

subjects at each meeting, and the discussions which follow are usually of more importance than the paper itself, each member contributing his experience in determining the real worth or worthlessness of any particular part of the subject. We also have an exhibition schedule encouraging the display of flowers, fruits, and vegetables in season at each meeting; also a short talk on seasonable hints. During June we exhibited at the Lake Forest Horticultural Society's show and was awarded a Special Certificate of Merit for the flowers and vegetables exhibited. The Mid-summer Fair held at Lake Geneva during July was a decided success, and well worthy of a visit to all lovers of Horticulture. At this exhibition could be seen rare exotic plants showing the extreme skill of the grower, collections of flowers and vegetables rarely seen in any other part of this country—each gardener trying to excel his neighbor in the gorgeousness or value of his display. The next exhibition we took part in, was the Chicago Flower Show held in November, where the Lake Geneva Gardeners made a very creditable showing. In competition with wholesale growers, our members showed their skill in taking off some valuable prizes; especially was this true in the competition of large chrysanthemum plants and the many types of single, which are now gaining favor with the flower loving public. At the school children's exhibition held at Lake Geneva in October, a decided gain was clearly visible from the preceding one; five hundred plants were furnished the children during May, and money prizes amounting to $48.00 was awarded to the successful growers. Extreme interest was taken by the children, and it was gratifying to the parents and public in general to notice how these little ones developed an inherent love for things that are beautiful.

The Chrysanthemum Show held November 15 and 16th was an unqualified success. The support offered by the Honorary members was a leading feature. Prizes in money and silver cups were offered, and the competition was keen in every class. Chrysanthemums, of course, predominated, but a creditable showing was also made in the different classes for winter vegetables and fruits,—a feature that is gradually but surely gaining favor with the public. Growers from outside contributed to the success of the exhibition. Poehlman Bros. of Morton Grove, Ills. exhibited a splendid collection of Tea Roses, including their new rose "Cardinal." The skill of this concern in growing a high class

of flowers cannot be disputed. Julius Roehrs & Co. of Rutherford, N. J., had on exhibition a wonderful collection of orchids, including Odontogle Grande (The baby orchid); Vaughan's Seed Store contributed, besides chrysanthemums, their baby roses in both pink and white, grown in baby pots (Carnations from Wm. Meine, Indiana).

During the summer, the usual custom of visiting the various nurseries and green houses in different parts of the country was carried out. At least once a year, the Association visits the places in charge of the respective gardeners in a body.

Just recently, we have become incorporated.

During the past year, several of our assistant gardeners have been appointed to positions of trust in different parts of the country, which is proof enough of our high standing as a body.

During the past year, prominent horticulturists have visited us in their respective capacities, and have always met with a mutual and cordial good-fellowship. We are at all times, in correspondence with members of our profession in all parts of England, Germany, Austria and France, and always in a position to offer any information on any subject pertaining to Horticulture in its many branches.

Horticultural visitors to Lake Geneva are always welcome; a glad hand is always extended to those interested in the profession and it is not uncommon to have a nursery drummer knock at the door of a Lake Geneva gardener at midnight and tell his little tale of *woe,* being locked or crowded out of the hotel, and unable to find a pillow on which to pound his weary head. He is at once taken in as one of the family.

Before closing, I wish to say a few words of commendation of the Wisconsin State Horticultural Society. The untiring efforts of its officers have brought this society to a higher state of perfection than any other State Society, and too much cannot be said in praise of these gentlemen.

LAKE MILLS LOCAL.

Mr. Geo. J. Kellogg: Our secretary will make a report for the Lake Mills Society. We had a fine exhibition of strawberries in June or July, and the ladies took hold and we had a very fine display of roses. We have had two meetings since our annual meeting and a little over four weeks ago we had an election of officers. Our next meeting will be held a week from next Friday night. Our Society comprises about twenty-five members; we are in nice running condition. If it were not for the ladies though, we would make a failure. Perhaps I should say a word in behalf of Lake Mills. We are right in a horticultural country there. Fifty and sixty years ago we had half a dozen nurseries and they had horticultural meetings that were attended by delegates from Whitewater, Milwaukee and different parts of the state; they had horticultural meetings there that were A No. 1. Now, it is hard work to keep up a horticultural society. We have some of the old members, L. D. Fargo, who ran a nursery fifty years ago, and he is one of the most enthusiastic forestry men that we have, he has been practicing what he preaches in his own forest for fifty years and when J. C. Plumb was there, Isaac Atwood, J. C. Brighton and Stearn of Whitewater, when we had those men to talk about horticultural interests, why, it was just fun to have horticultural societies. There were some orchards of forty acres that produced from three to five thousand barrels of apples a year. Now, there are only a few scattering trees left on the forty acres. They had at one time up there a lot of seedlings that produced six barrels to the tree. I have been looking up the horticultural interests during the last few years, the soil is all right, if they had only kept planting them, but they let the orchards go by default. Sometimes the canker worm cleaned out an orchard, sometimes the tent caterpillar, but the early history of horticulture was far ahead of what it is now and far ahead of what it was in any part of the state.

REPORTS OF DELEGATES TO OTHER SOCIETIES.

REPORT OF DELEGATE TO MINNESOTA MEETING.

W. S. HAGER.

It was my pleasure to meet with the members of the Minnesota Society in their 41st annual session. They are as enthusiastic and genial a lot of fruit and flower cranks as are all Horticulturists. They certainly used me finely. I met many old and made many new friends, I hope.

In sketching in a small way what I saw and what was done, I judge that what the society wants is not a review of the programme, but of such things as seem of most interest to the Horticulturists of Wisconsin. While comparisons may be odious, yet I cannot help having our society in view when writing this.

The meetings were usually well attended, but, as with us, some of the members were slow getting around in the mornings. Their fruit display certainly was great. There were over 1,000 plates of apples and 32 pecks; shown mostly for premiums, although some enthusiastic growers had some fine exhibits, just to help out. One of the finest of these was made by A. D. Brown of Baraboo, and I think if he had been allowed to compete he would have carried off the lion's share in those varieties shown by him. He had a table by himself and I heard many expressions of wonder and praise for his fruits, and that by professionals.

A. J. Phillips had 30 plates of top worked apples. Chas. G. Patten had 55 seedlings of his own origination. There were 18 plates of grapes that were fine for the time of the year, and a fine collection of nuts, and specimens of wood from nut bearing trees.

As an indication of what they are doing commercially it was reported that from nine stations in Fillmore county there was shipped last season 78 cars or 12,480 barrels of apples. It seems as though they are using the same varieties that are successful in northern Wisconsin, although locality and soil seem to make some difference.

To me one of the most interesting papers was that of Mr. Elwin of Richfield who told of his plum orchard of 2,000 trees. His conclusions are; plant small trees, prune back heavily, or they will be torn to pieces by the winds. Varieties—Surprise, Hawkeye, DeSoto and Weaver. Of course I liked his conclusions as they compare so nicely with mine. He sprays, and has found that it pays to mulch for summers. Markets in 16 quart cases and would use no other.

Upon starting to their meeting I had in mind to try to see why they have larger meetings and more members than have we of Wisconsin. And in sizing up the attendance and where they came from I found that a very large percentage of them came from St. Paul and Minneapolis and immediate vicinity. In other words it is location. They have those two large cities to draw from. The same reason that makes the Minnesota State Fair larger.

There seems to be a diversity of opinion as to varieties, some thinking that we ought to propogate the best of what we have while others are looking toward selected seedlings for something better.

I cannot close this brief better than quoting one paragraph from the President's address:

"Horticulture is an art of endless possibilities and changes, and no person of experience in such matters ever feels that he knows it all. Its devotees are generally altruisic, enthusiastic and optimistic, and have no secrets. They take pleasure in helping the beginners to get started, even though by so doing they increase the competition that they themselves are destined to meet. As a business horticulture differs from most others in this respect, and yet those who succeed best in it have broadening qualities in large measure."

REPORT OF L. H. PALMER OF THE ILLINOIS HORTICULTURAL CONVENTION.

Champaign and Urbana, two cities in one, the home of the Illinois University, are very pleasantly located and presents this advantage that Illinois can send sons and daughters there with-

out having them contaminated with the saloon as there are none in either city.

There was a very good attendance of very enthusiastic horticulturists and everything was done to make your delegate feel at home. The continued frosts worked great havoc with their fruit as well as with us the past season. The Illinois Horticultural Society is subdivided into three divisions, the northern, central and southern. The fruit exhibit was divided in the same manner. The papers were fine and to the point. I was particularly interested in the talk on spraying as it seems they have more trouble from Bordeaux scald than we do in Wisconsin. Mr. Perrine will use but three pounds of copper sulphate to fifty gallons of water for the first application and after the blossoms fall will leave it out entirely. He uses arsenate of lead for a poison believing that it is also a remedy for fungus diseases. The San Jose scale is a great problem with them, but the general opinion was that the lime-sulphur mixture would keep it under control if taken in time.

Mr. Hartwell in his paper on strawberries thought it better to plough up old beds than to take the trouble to spray.

The show of fruit was fine considering the trouble they had from frosts the past season.

REPORT OF DELEGATE TO NORTHEASTERN IOWA.

J. G. BUEHLER.

As I journeyed on my way to Independence I looked in vain for orchards but I failed to see them along the Mississippi River from North McGregor to Dubuque. I saw on either side what I thought would be beautiful orchard sites. When I left Dubuque going west it was moonlight and I was of course unable to discern much of the country. I arrived at Independence at midnight and was soon at my quarters at the Gettney Hotel. It seemed that I was the first one there as I found no one of the horticultural type. I retired and I was not crowded for room.

The first thing in the morning after a hearty breakfast I went in search for the cage of my feathered tribe. I found it near the hotel. I walked in and found nobody there. I began to think perhaps I would be the whole convention and what to do with my apples but as I stepped out I met one congenial old gray-haired earth being. He looked wise and asked a few questions. I soon found out his great personality, Iowa's wizard, Luther Burbank the II, C. G. Patten. Others began to arrive and the arrangement of fruit began. I think there were eight exhibitors, one from Minnesota, one from Wisconsin. Minnesota must have eaten his fruit at home for he had nothing to show but a few shriveled up wild crabs and a quart jar with a few pebbles of lime to show that the lime was slack. Wisconsin surprised and surpassed all other exhibits in point of beauty.

An apple without a spot from scale or blemish could hardly be found. A large number of seedlings were shown but few desirable market varieties. The Silas Wilson produced by C. G. Patten struck me as the most favorable in quality and color but lacks size for a commercial seller. The Wealthy, our favorite here, seemed to be almost a failure there on account of blight. The Northwestern Greening is reported a failure in some localities, Patten Greening seems to be quite a favorite out on the prairies. The small fruit growers seemed to be quite in evidence and interested. The black currant seems to be a favorite with some as worms seem to leave it alone. No doubt the poor quality. One enthusiast claimed he could grow the currant and gooseberry bush for shade trees then cut them down for saw logs.

The prairies of Iowa did not strike me as forcibly for orcharding as the beautiful wooded hills of southwest Wisconsin. As to markets they are no better situated than we are in Wisconsin.

REPORT OF T. E. LOOPE OF THE IOWA HORTICULTURAL SOCIETY.

By courtesy of officers of the W. S. H. S. I was invited to attend the Iowa State Horticultural Society as delegate from Wisconsin. I should have been glad to skip giving an account of business but the ultimatum was to go without fail, no excuse permitted. I am accustomed to obey orders from superiors in authority and on December 9th, I started, arriving at Des Moines on Tuesday morning. I repaired to the State House at 10 A. M. and found the Society very nicely installed in a pleasant and commodious office on the first floor. They have a large library occupying one side of the room, well stocked with books and reports. The secretary, Mr. Green, greeted me pleasantly and told me to make myself at home. Later I was made an honorory member on asking permission to make a motion. At the hotel at dinner I found C. G. Patten, C. L. Watrous and Col. Brackett of Washington and enjoyed their society very much during the sessions and afterward.

The attendance averaged nearly fifty, being made up largely of middle aged men with a few younger men and fewer women. Many grey hairs and bald pates were in evidence but they were a superior body of people in intelligence and experience.

The numbers on the program were well treated and interesting, showing a good knowledge of the subject under discussion.

At the banquet on Wednesday evening we were treated to an elaborate menu and "the band played on." Civic improvement was ably and fluently handled by Hon. G. H. Van Houton who pleaded not only the beautifying of the cities but also the farms and villages of the state. Domestic Science was handled by a lady professor, Edith G. Charlton of Ames; who told the duties appertaining not only to the women but also laid many obligations on the men. She said that it was impossible to elevate the natural manners of some men and I thought her piercing Hawkeye was fastened on me, perhaps because I was a badger and was used to groveling in the dirt but I shrunk down lowly in my seat hoping no one else would see her objective point.

The subject of Weeds by Alson Secor came next and he told of many varieties of weeds and their noxious qualities comparing an illeterate empty headed man with vicious tendencies, as

having weeds on the brain. I was glad my wife was not present for she would likely tell me that I sometimes had weeds in my head instead of calling me an old fool as usual. I'd rather be a fool than weedy.

Prof. Beach told us of apples and related how he used to get up early to pick up apples from the Deacon's trees that fell over into their yard. It took him back to boyhood and altho he had been in many climes (here he looked up and raised his arms showing the kind of "climbs" he probably had made in childhood) still the memory of those apples clung dearest in his heart.

Hon. Eugene Secor told us why Adam ate the Apple and I concluded from his description of Eve in her beauty and engaging charms arrayed in living colors that he could have tumbled to the opportunity of eating a beautiful luscious apple or even any old fruit and risked getting choked on the core and always wearing it there for the gracious smile of such a maiden. I almost think I would anyway.

At this point in the program having heard a member say they would call me out I read the appropriate lines they printed on the program as follows:

"And the night shall be filled with music
And the cares that infest the day
Shall fold their tents like the Arabs
And as silently steal away"
As I stole to the depot.

REPORT OF L. G. KELLOGG, DELEGATE TO MICHIGAN HORTICULTURAL SOCIETY.

When the fruit growers of Michigan assembled at Battle Creek on the morning of December 3rd, 1907, for their annual meeting I found the state represented by a large attendance of intelligent, enthusiastic people, including delegates from Ohio, Illinois, Connecticut and New York. The veteran fruit grower Mr. J. H. Hale of Connecticut and famous as a large peach grower in Georgia was present during the entire session and ever ready to take part in the discussions. Mr. Hale is a man who has

made a life study of nearly all the phases of commercial fruit growing and is possessed of an unlimited fund of knowledge, wit and story which will cause this annual meeting one long to be remembered in the history of this society.

I am scarcely doing justice to the fine program in a short report by giving a synopsis of all the topics presented and will endeavor only to bring out a few of the most prominent features of the convention.

There was a large and interesting exhibit of apples consisting mainly of the following varieties: Baldwin, Greening, Spy, Steel's Red, Tolman, Wagner, Johnathan, York Imp., Fameuse and King, also a few plates of fine pears and quinces. The display made by the Michigan Agricultural College in charge of Prof. Fletcher and his assistants was very unique and instructive. It was comprised of 45 jars of canned fruit, 60 plates of fresh fruit, 60 varieties of potatoes and about 25 specimens of limbs, twigs and leaves covered with insect pests and fungus and showing the diseases to which the fruit trees are subject.

On Wednesday morning an invitation was extended to all of the delegates and members to participate in a trip to the Postum Cereal Plant, one of the large industries of Battle Creek. A large number availed themselves of the opportunity and after inspecting the commodious offices were invited in the dining room where a light lunch was served and the usual courtesies extended. The delegation then returned to the convention hall and took up the regular work of the program which was designated as a business session, reports and election of officers. The election of officers was very harmonious and unanimous only one candidate being presented for each office. With one exception all of the old officers were re-elected.

A unique feature of the convention was a students' fruit judging contest. About a dozen of the students from the graduating class of the Horticultural Department of the Agricultural College were present and participated in the contest. The work was done under the supervision of S. W. Fletcher, professor of Horticulture. The students were required to work from a score card, name each variety of apples and score the points in its favor. The points consist of form 15, size 25, color 30, freedom from blemish 30. Total 100 points.

Prizes were awarded in this contest and the young men showed

skill and ability, proving conclusively that they had had good training in this line of work and no doubt some of them will be called as expert judges at some of our great future expositions.

On Wednesday evening all of the members were invited to participate in a banquet given by Dr. J. H. Kellogg of the Battle Creek Sanitarium. This banquet was very unique in so far as it pertains to the menu, Dr. Kellogg being a strong advocate of a purely fruit and vegetable diet, no meats of any kind being served. The entire bill of fare being prepared from fruits, nuts and vegetables.

From the enthusiasm displayed at this convention the state of Michigan certainly has a great future in her possibilities as a fruit growing state.

I met with a very cordial reception and all of the courtesies were extended that possibly could be to a delegate from a neighboring state. I shall always have a warm spot in my heart for the members of the Michigan Horticultural Society as I feel that it was here that I met my full conversion and am ready to join the order of Knighthood of the Spray Pump.

FIELD INVESTIGATIONS IN POMOLOGY.

WM. A. TAYLOR, Pomologist in Charge of Field Investigations, U. S. Dept. of Agriculture, Washington, D. C.

The question that naturally arises first in this connection is "What is Pomology?" The simplest definition, and the one that would have been sufficiently comprehensive in earlier times would be that pomology is the science of fruits. That was the old definition. In recent years the field has broadened and the term pomology is interpreted to cover not only the science of fruits, including their classification and nomenclature, but the whole range of cultural, marketing and transportation problems affecting both commercial and amateur fruit growing.

You no doubt recall that our American pomology began with the description of fruit varieties published by Dr. James Mease, of Philadelphia, in the first American edition of Willich's Do-

mestic Encyclopedia, which was published in Philadelphia in 1804. That list of varieties consisted largely of sorts that had originated in New York, New Jersey and eastern Pennsylvania, including Newton Pippin, Esopus Spitzenberg, Yellow Bell Flower and a number of other varieties that are important at the present time. Following him, William Cox, in 1817, published his View of the Cultivation of Fruit Trees, the first book in America devoted entirely to fruit varieties and fruit culture. Later the writings of Thacher, Prince, Manning, A. J. Downing, Charles Downing, Thomas, Barry, Elliott, Warder and more recent pomologists discussed various phases of fruit growing. Most of these earlier writers emphasized the importance of varieties rather than of methods of culture, or of utilizing the product.

In recent years the large development of commercial fruit growing in America has made necessary closer attention and more systematic investigation of marketing and transportation problems.

The Field Investigations in Pomology of the Bureau of Plant Industry at the present, comprise the following somewhat distinct lines of work:

1. Fruit marketing, transportation and storage investigations.
2. Viticultural investigations.
3. Fruit district investigations.
4. Pecan investigations.

Under the general head of Fruit Marketing, experimental studies of different phases of the question are being made with regard to their bearing on both domestic and foreign trade in American fruits. It is very generally recognized that of many of our fruits the present plantings are likely to produce in favorable seasons much larger quantities of fruit than have ever been produced in the past. If disastrous gluts are to be avoided, wider distribution of these products will need to be accomplished, and while it is believed that by far the larger portion of most of our fruit and fruit products will always be consumed in the United States, a healthy export demand is considered one of the most important factors in preventing an undesirable surplus of fresh fruits at times. In connection with this work an investigation of the possibility of developing trans-Atlantic demand for eastern grown Bartlett pears was undertaken a few years ago.

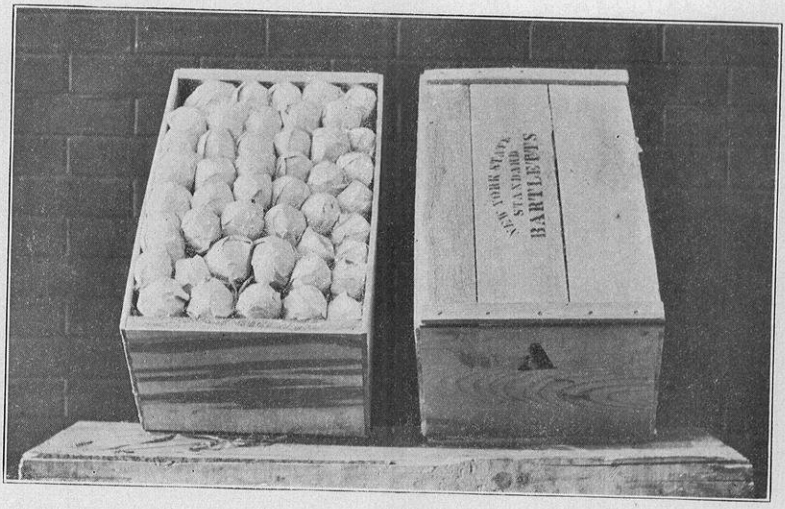


Fig. 1.—New York Bartlett pears in 40 lb. boxes for export. (This and (4) following illustrations furnished by Wm. A. Taylor, Washington, D. C.)

Fig. 2.—A carrier of Georgia Elbertas packed for export.

It will be recalled that at that time there was a rather threatening surplus of Bartlett in the Lake Region, particularly in Western New York in almost every year of a full crop. The leading fruit shippers, including those who were successfully exporting winter apples did not consider the exportation of eastern grown Bartlett pears practicable, occasional shipments made in barrels having arrived in bad order. A series of experimental shipments in which barrels, forty-pound boxes and twenty-pound half boxes were tested under identical conditions speedily proved that while it was difficult to deliver the Bartlett pear in Great Britain in sound condition in so large a package as a barrel, it was comparatively easy to make sound delivery in boxes (Fig. 1) and half boxes. It was also demonstrated that there was active demand for this fruit in British markets, and that it yielded a good net return to the shipper. As a result of this a pear export business has developed, which at present ranges from $250,000 to $650,000 in value annually.

A somewhat similar condition as regards future surplus of early apples in the middle Atlantic states and peaches (Fig. 2) in some sections of the country, notably Georgia and Texas exists at the present time. Work along these lines is therefore being prosecuted. Much work is also being done in connection with the determination of the causes of deterioration of the American winter apple in transit to both domestic and export markets. (Fig. 3.) The apple is our most important export fruit. Investigation of market reports reveals the fact that out of 100,000 barrels of Baldwin apples from the United States handled by one British House from the ports of New York, Boston and Portland, Me., for a single year, more than 20% were condemned by the inspectors upon arrival at Liverpool as "slack," "slightly wet," "wet" or worse. As the Baldwin is one of our best shippers and probably constitutes about 50% of our entire apple exports in most seasons, the importance of reducing this deterioration is evident.

Under present conditions fruit growing has come to be a very complex proposition.

FRUIT TRANSPORTATION AND STORAGE.

In order to definitely locate the causes of the troubles that become conspicuous at the market end of the line, it is necessary

to determine the exact history of the fruit from the tree to the salesroom, before the responsibility for any particular decay or deterioration can be fixed, and remedies or preventives be devised. (Fig. 5.) Realization of this view has resulted in the devoting of particular attention to the questions involved in the transportation and storage of fruits. In this work, which is conducted by Mr. G. Harold Powell, and an able corps of experts, effort is being made to determine the underlying principles that govern the maturing of fruits, with a view to readjusting our harvesting, packing, transporting and storage methods, so that they will conform to the actual requirements. Much work has been done with the peach, the apple, the pear and the small fruits, but for sometime past, particular attention has been paid during about six months of the year to the problems connected with the handling of citrus fruits in California. Work has been concentrated upon this field not because it was more in need of help than other fields, but because the strong co-operative organization of the citrus industry in that state, taken in connection with the railroad transportation and refrigeration service already developed, rendered the conditions very favorable for the systematic working out of principles that are expected to be found applicable to fruit handling throughout the country. The work has had very generous support by practically all the interests involved and the results obtained and already in view have been gratifying to all connected with the industry. Some of these results may be briefly summarized as follows:

The former general practice of holding oranges in the packing house for several days to "cure" before packing and shipping has been largely abandoned because of the demonstration through these investigations that with the methods of handling that are ordinarily practicable, each day of delay in the packing house temperatures results in an appreciable increase in the amount of decay developed in transit regardless of method of shipment.

The discovery and demonstration of the fact that the fundamental and most common and important cause of decay in transit is mechanical injury to the fruit in harvesting, hauling or handling it in the packing house through carelessness of employes, use of unsuitable tools, and machinery, especially those of complex character which are easily put out of order has resulted in the reconstruction of a number of cooperative and in-

Fig. 4.—Strawberries wrapped in Japanin paper for storage. Prevents tainting of flavor.

Fig. 5.—A "slack" barrel of apples.

dividual packing houses with a view to better handling of the fruit. Simpler devices are being installed and they are being run at lower speed, greatly to the advantage of the fruit. The labor cost of the handling is increased somewhat by these more careful methods, but the reduction in decay and the increased prices obtained for it in the market are yielding handsome profits to those cooperative associations and individual shippers who are putting the principles into practice as they are discovered.

The beneficial influence of quick cooling upon fruit that is to be shipped long distances by checking the ripening processes and retarding the development of decay both in transit and in storage, is now generally recognized. It was first thoroughly tested and established in this work, and while larger development of facilities for the commercial cooling of fruits for shipments has occurred in California than elsewhere, the principle involved is of general application and is destined to profoundly modify the general practice with other fruits and in many regions. Some 300 carloads of oranges were thus handled in southern California in 1907, greatly to the advantage of the shippers who were able by this method to hold their fruit in sound condition much longer than usual, thus steadying instead of glutting the markets at critical times. The loading of the fruit in a cool condition made it possible to fill the car much fuller than is usual without risk of producing a high temperature in the top of the car, which is destructive to the upper tiers of fruit. The carrying capacity of the cars loaded with precooled fruit was increased from 10 to 40 per cent in contrast with ordinary method.

The strikingly beneficial results have led to the utilization of all cold storage facilities in the region and the erection of several cooling plants, and according to recent press reports, the preparation for the erection of large plants by the Southern Pacific and Santa Fe Railroads at convenient assembling points on their respective systems. There is some danger that too great haste may be made, but the policy in this work is to advance through experimentation rather than to recommend hasty action in such cases.

The value of this work to the citrus industry of California during the past year has been estimated by leading growers and shippers to be worth at least a million dollars annually.

Individual instances of improvement in results obtained in orange shipments may be noted as follows: One of the largest orange growing enterprises in southern California, a corporation owning several hundred acres of groves and packing its own fruit, had usually had from 5 to 30 per cent of decay in its shipments upon arrival at destination. Inspection of the methods practiced in grove and packing house made by the Bureau representatives in 1905 showed that the fruit was handled with about the average care used in the region at that time. Investigation showed that 20 to 25 per cent of the oranges were cut with the clippers or were stem punctured, and that the packing house which was equipped with overhead sizer, contributed to the further injury of the fruit. The company was advised to change its method of picking from box rate to day labor and did so. In 1906 and 7 it was found that the percentage of clipper cutting and stem puncturing has been reduced to from 1 to 3 per cent. The packing house has been modified the brushing of the oranges has been stopped, the packing and loading of the cars has been done with care, with the result that shipment under ventilation has been found entirely satisfactory for at least two months after most of the shipments from southern California have been forwarded under ice. This results in a saving of $65 to $85 per car, according to destination. During this same period the market reputation of this pack has steadily risen because the fruit commanded the confidence of the buyers by arriving in sound condition day after day. Prices received for the fruit have been near the top of the market throughout the season of 1907. The additional cost of careful handling is estimated not to have been more than 10c per box.

Another instance is that of a grower with large acreage whose fruit early in the season of 1907 arrived in New York in bad order, some carloads developing as much as 25 per cent of decay. Both shipper and receiver ascribed the decay to excessive tenderness of the fruit brought on by over-fertilizing or other methods in handling the groves. An investigation showed that about 20 per cent of the fruit was mechanically injured in handling. As a result of this, the grower radically changed his methods, adopting the suggestions of the Bureau representatives, with the result that the decay in the commercial shipments disappeared almost immediately and did not reappear through

Fig. 3. Packing an experimental export shipment of winter apples in West Virginia.

the season. This grower has recently stated that by insisting rigidly on the careful handling of the oranges the net increased receipts averaged from 50c to $1.50 a box after the change in methods was adopted.

A third illustration is that of a cooperative association which in 1905 had the reputation of producing fruit of the poorest carrying quality though it was excellent in other respects. Receivers had come to expect excessive decay in the brands of this association. It was generally ascribed to mysterious local climatic and soil conditions. Investigation of the groves and the house showed that the groves were badly infested with scale and the fruit was badly disfigured by sooty mold, which rendered washing and brushing necessary. The packing house was found to be very complicated, the fruit that was washed passing through more than a thousand feet of machinery of different kinds before it was packed. The fruit often remained in the house a week or more before it was shipped. Packing house and shipping experiments were carried on in cooperation with this association in 1906 and 1907, with the result that the members of the association became convinced that their fruit was not inherently poor in keeping quality but was being injured by the manipulation made necessary by the presence of the scale upon the trees. There was general fumigation of the groves in the autumn of 1906, so that in 1907 not more than 50 per cent of the fruit needed to be washed. The overhead machinery in the packing house was eliminated, the picking was done with care, part of it by a picking crew controlled by the packing house, and the fruit was shipped out much more quickly than previous. The average decay shown in the shipping experiments from this house in 1907 was as follows:

Apparently sound, brushed fruit	1.8%
Apparently sound, washed fruit	2.6%
Commercially packed fruit	4.8%
Mechanically injured fruit	26.9%

This association has not yet reached the limit of practical improvement, but the reputation of its brands of fruit has already been elevated to a higher class, as the fruit has continued to arrive in the markets in better condition than formerly.

As a general result of this work, it may be stated that the entire practice of handling and forwarding oranges in California

is in process of quite rapid modification in the direction of more careful harvesting, simpler equipment and prompter shipping than formerly. In addition to this, in several places equipment for quick cooling or pre-cooling is being installed. In connection with these changes, there has been a gratifying reduction in the percentage of decay of the crop as an entirety reported by receivers.

VITICULTURAL INVESTIGATIONS.

The work in viticultural investigations at present is mainly concentrated upon problems connected with the determination of the relative adaptability of resistant stocks to typical vineyard soils on the Pacific Coast and relative congeniality of the vinifera varieties of these stocks. This work is conducted by Mr. George C. Husmann, with several assistants. In this connection eleven cooperative experimental vineyards are maintained in which several hundred of the leading resistant varieties, direct producers and raisin, table and wine grapes are being tested. Another important feature of this work is the investigation of the rotundifolia grape varieties of the South Atlantic and Gulf states of which the scuppernong is the best known sort. In cooperation with the North Carolina state agriculture department a mother vineyard for this type of grape has been established in which all the important varieties are being tested and the methods of trellising, training, pruning, etc., are being worked out.

FRUIT DISTRICT INVESTIGATIONS.

Under this head, effort is being made by Mr. H. P. Gould and an assistant to determine more accurately than has been possible the approximate cultural range of fruit varieties and their adaptability to growth for different purposes in particular districts. Special attention is being paid in this connection to the fruits grown in the Blue Ridge and the Allegheny Mountain region of the east and the Ozark region of the west. In connection with it several hundred cooperative observers are making notes of the dates of blossoming, leaf, ripening, etc., of orchard fruits from year to year.

PECAN INVESTIGATIONS.

Under this head effort is being made to determine the adaptability of the recognized choice varieties of this nut to different sections of the south to determine their self-fertility, the causes of non-filling of kernel, etc., and other points of information in connection with this rapidly developing branch of the fruit industry.

PROCEEDINGS

WISCONSIN STATE HORTICULTURAL SOCIETY. ANNUAL CONVENTION.

MADISON, February 4, 5, 6, 1908.

AFTERNOON SESSION—FEBRUARY 4.

The meeting was called to order by President R. J. Coe at 2 P. M.

The president appointed the following committees:

Credentials—L. G. Kellogg, Wm. Longland, G. W. Reigle.

Reception—M. E. Henry, C. L. Richardson.

Resolutions—Geo. J. Kellogg, W. S. Hager, C. L. Pearson.

Revision of premium lists—A. J. Philips, Wm. Toole, D. E. Bingham.

PRESIDENT'S ADDRESS.

Again we have met in annual convention to review the work of the past year, to renew old acquaintances and form new ones and to plan a campaign for the future. The year has been one of varied activities along all horticultural lines, and so far as this society is concerned, we feel that we have made very substantial progress and that we are in much better position than we have ever been before to carry on the work that has already been inaugurated and to take up and carry forward a great deal of new work.

The trial orchards have become a prominent feature of our work and are beginning to demonstrate the wisdom of planting

and maintaining them. The one at Wausau, now ten years planted, has fully demonstrated that, with proper care, a suitable location and the right varieties, apples can be successfully grown in Central Wisconsin. It has also shown that cherries are a very doubtful proposition in that section. While others planted in the northern part of the state are not yet of sufficient age to show what can be done in that section. From our short experience at Poplar (which is near Superior) it would seem that the varieties that will succeed in that section must be of the hardiest, and that but few of the many varieties planted are likely to survive the rigors of that climate for any great length of time. Undoubtedly there are some localities in that region where apples will succeed, but that they will succeed generally is extremely doubtful.

During the year two new orchards have been located, one at Manitowoc in Manitowoc county and one at Gay's Mills in Crawford county not so much to test varieties, for almost any variety seems to do well, but to try to demonstrate that a large quantity of a very few varieties well grown will find a ready and profitable market, and that in favorable locations this branch of horticulture can be made a very profitable proposition. The increasing number of trial orchards calls for an increased outlay to properly care for and keep in good condition, but thanks to the persistent and efficient efforts of our secretary, aided by a great many of our members and our friends in the legislature, we now have a largely increased appropriation which will enable the society to very greatly extend its work and increase its usefulness, not only along this line, but in many other lines as well.

During the year we have lost three of our members by death and have added to the roll ———— new members, being a very gratifying increase in our membership. This question of membership I consider a very important one, not so much for the membership fee as for the influence of the members themselves. Every *working* member we can enlist into the army of Wisconsin horticulturists is just one more lever to help pry the other fellows out of the rut of hog and hominy and bare surroundings style of living on to the higher and better way of having plenty of fruit and vegetables and grounds well planted with trees and shrubs, with plenty of vines and flowers about the house. Wisconsin

needs a lot of tree planters. Henry Cuyler Bunner has so beautifully expressed what I would like to say in regard to tree planting in his "The Heart of the Tree" that I will give it in his own words.

What does he plant who plants a tree?
He plants the friend of sun and sky;
He plants the flag of breezes free;
The shaft of beauty, towering high;
He plants a home to heaven anigh
For song and mother-croon of bird
In hushed and happy twilight heard—
The treble of heaven's harmony—
These things he plants who plants a tree.

What does he plant who plants a tree?
He plants cool shade and tender rain,
And seed and bud of days to me,
And years that fade and flush again;
He plants the glory of the plain;
He plants the forest's heritage;
The harvest of a coming age;
That joy that unborn eyes shall see—
These things he plants who plants a tree.

What does he plant who plants a tree?
He plants, in sap, and leaf, and wood,
In love of home and loyalty
And far-cast thought of civic good—
His blessings on the neighborhood
When in the hollow of His hand
Holds all the growth of all our land—
A nation's growth from sea to sea
Stirs in his heart who plants a tree.

ANNUAL REPORT OF SECRETARY.

This annual task of presenting a report on the work of the Society for the past year by your secretary is approached this year with an unusual amount of satisfaction for the year has been filled with encouragement. Perhaps in no other year in the history of the Society has the field of our activities been so widened, so many big things happened, so much accomplished that will place our Society in a position to be more helpful to all the people of the state as in the year 1907.

Appropriation.

The big thing of course was the very substantial increase in our appropriation from $4,400 to $8,000.

Bill 314 A, introduced by our fellow member W. S. Hager, member of assembly from Brown county, passed through the various and devious stages of legislative detail, followed closely at all times by assembyman Hager and senator Pearson, finally passed both houses without a dissenting vote early in June. In reviewing the history of this appropriation bill and seeking the causes which led to its success we find three factors prominent:

First, and foremost, the persistent and untiring efforts of our representatives in the legislature, Mr. Hager and Mr. Pearson.

Second: The splendid help given by the committee of one hundred members which staid by the bill to the finish. This committee selected with reference to their location in the state, or rather the various assembly and senatorial districts, furnished splendid assistance by correspondence and personal interviews with members of the legislature. Originally one hundred, the number soon dropped to 90 and later to 78 but the faithful 78 never faltered unto the end.

The third factor leading to success was the work which the society has accomplished in the past. Our record was good and our character as an organization above reproach.

Stating these points again in the reverse but logical order we find first; that as a Society we had "made good" to the people of the State, we had been faithful to our stewardship.

Secondly: Our members were faithful to their trust and showed their interest by informing the legislature of these facts and thirdly we had efficient members in the legislature who looked after our interests.

Altho paradoxical it must be said that the only opposition shown in any quarter to our bill served eventually as a help in that the true nature of the opposition was made known to the members of the legislature and served in a reactionary way to help our cause.

Another bill affecting the Society passed both houses but was vetoed by the governor. This bill if it had become a law would have permitted us to issue our report in monthly installments similar to the Minnesota plan.

Trial Orchards.

Another cause for congratulation is the rapid extension of our trial orchard work in a new field. This will be given in more detail in the report of your secretary as Superintendent of Trial Orchards.

Farm Institutes.

By action of the Executive Committee in session at Shiocton August 28th the secretary was authorized to arrange with the Superintendent of Farmers' Institutes for a special lecturer who should devote all of his time to talking horticulture. While your secretary believed then and is still of the opinion that the Department of Farm Institutes should assume the entire expense of such a lecturer the best arrangements that could be made was an equal division of the salary and expenses with certain provisos covering appointment of lecturer, the lines he should follow, etc. At the December meeting of the Board of Managers the appointment of Mr. D. E. Bingham was announced by Pres. Coe and confirmed by the Board. Mr. Bingham began work on December 10th and has since been doing most excellent work.

Change in Membership Fee.

The society in convention at Shiocton adopted an amendment to the constitution reducing the fee for annual membership to

fifty cents. This with the action of the Society at the 1907 annual convention making the fee for members of local societies twenty-five cents has served to materially increase the membership. The total number of members this date, (Feb. 1st) is 702, an increase of 32½ per cent over last year at this time.

The total number of life members is 98, an increase of 16 since my last report.

As stated in previous reports the membership is held on a strictly cash basis and those who do not send renewal fee within a reasonable time after being notified are dropped from the list promptly. The increase has come very largely as a result of persistent newspaper advertising and circular letters.

The older members of the Society are frequently urged to aid in increasing the membership roll but results from this source are not encouraging.

When mailing the programs of this convention early in January a circular letter was enclosed to 370 carefully selected members including the officers and members of the executive committee asking them to secure one member each before this convention. The following only reported.

(Read List)

Now for the first time, fellow members during my four years' service as your secretary I register a complaint. I have so far endeavored to excuse the officers of the Society and older members when appeals of this sort have failed of results on the grounds of lack of time and other reasons but I am now about ready to conclude that it is a lack of interest, a lack of "esprit de corps," a lack of enthusiasm on the part of the majority of our members the expression of which places the Minnesota Society in the lead as far as numbers is concerned. Your secretary can and should do much in the way of advertising and soliciting memberships but he cannot do it all, for unless each individual member will put his shoulder to the wheel and push a little our progress must be slow. The circular letters sent you, fellow member, soliciting your aid, imploring, even begging you to get new members costs money to send out, and are always earnest personal appeals to you and are deserving of a better fate than to be laid aside perhaps with a smile and the thought that "Cranefield likes to talk." Having thus relieved my mind I will proceed with the statement of work for the year.

Publications.

The Annual Report was distributed to members in May, the earliest date on record. The demand for the report has been greater than in any previous year. Continuing the plan inaugurated in 1905 several hundred copies were sent to county clerks for distribution among town chairmen and a package of 24 is forwarded to each Farm Institute where Mr. Bingham speaks. A very limited supply remains on hand. But two bulletins have been issued during the year, viz. No. 11, Seedless Apples, 2,000 copies, 11 pages, 4 illustrations. No. 12, The Blight Canker of Apple Trees, 2,500 copies, 23 pages, 17 illustrations. The demand for our bulletins does not increase hence the number issued has been cut down.

Local Societies.

Oshkosh reports the organization of a local society which makes twelve locals affiliated with the State Society. Some of these are towers of strength to the parent society and some are but weak props. The societies at Madison and Lake Geneva continue to enroll their entire membership in the State Society; the Sparta and Manitowoc Societies each enroll a fair delegation, Oshkosh the youngest has also sent in 6 or 8 but of the others we must as usual pass over in silence. The greatest period of activity of these Societies in their connection with the State Society appears to be just preceding our annual convention.

Summer Meeting.

The meeting this year was held in Shiocton on invitation of the people of that place and the Shiocton Garden Land Co. The attendance was larger than at any other summer meeting in recent years and the program followed with much interest by all present.

State Fair Exhibit.

Our exhibit occupied the space permanently assigned us and consisted mainly of an exhibit of apples in bulk from Wausau orchard, twenty-eight bushels being shown.

County Fairs.

The increasing number of applications from County and District Fair Associations in the State prompted your secretary to propose to the Board of Managers a plan by which the judging or fruit at these fairs could be placed on a better basis. In pursuance of this plan I have written to every Fair association in the state offering suggestions for the revision of their fruit lists and the appointment of judges. The number and nature of the responses to date have been extremely gratifying and it is likely that a majority of the premium lists for the coming fairs will conform closely with the adopted lists of the Society and the exhibits be passed on by judges appointed by our Society.

Contract Orchards.

Inquiries multiply each succeeding year from members and others regarding the different contract orchard firms operating in the state and considerable time has been spent in investigating the plans pursued by these companies. The "Contract Orchard" has fallen into disrepute of late. Some years ago different reputable and responsible members of the society engaged in the practice of selling orchards on contract receiving a portion of the price in cash and agreeing to take the remainder at the end of a term of years or in lieu thereof a portion of the first crop. So far as I have learned these contracts were faithfully carried out by the seller and to the satisfaction of the buyer.

Within the past five or six years, however, there have appeared in the state, representatives of firms claiming headquarters and extensive nurseries in Ohio, Michigan and other states selling orchards on contracts of which the following is a fair sample.

Orchard Contract.

between

.....

.....Proprietors

of .....

Party of the first part and ..... of ..... County of ..... State of Wisconsin of the second part

Witnesseth, That the undersigned have agreed to enter into the following contract:

This Company, party of the first part, will furnish to party of the second part the following bill of trees etc. for the purpose of improving my property.

112 Apple	Quince
Crab	Grape
18 Pear	Gooseberry
42 Plum	Currant
Prune	Blackberry
Cherry	Raspberry
Peach	Strawberry

Varieties Written on Back Hereof.

All to be first class stock. At the proper time to plant trees above mentioned, the said second party shall have prepared the ground and agrees to have same in good state of cultivation, and to plant the trees above mentioned according to printed instructions furnished by the company. The party of the first part agrees to trim or prune the trees at the proper time, and to replace any trees etc. that may die within five years from the date of delivery free of cost, except trees that may be destroyed by stock or peeled or girdled by rabbits or mice.

In consideration of the above mentioned goods furnished and services by the party of the first part, the said second party agrees to pay to said Company, ninety dollars ($90.00) cash on delivery at ————, State of Wisconsin in the fall of 1904, and ninety dollars ($90.00) in cash on or before the Fall of 1909, being five years from the date of delivery, all cash payments due and payable at the office of the Company at ———— of the ————, party of the first part will accept one-half of the fruit produced the season of 1910 instead of above second cash payment, at the option of the party of the second part, the fruit to be delivered to nearest railroad station to purchaser.

The party of the second part further agrees that should I sell or otherwise dispose of the land on which this orchard is planted, during the life of this contract the deferred payments are due and payable at once. Said second party also agrees to cultivate and care for this orchard according to instructions furnished and to keep the same free from weeds and grass. Said second party agrees not to countermand this contract.

In Testimony Whereof, the ———— Orchard Co. by its

agent and said second party have hereunto set their hands and seals this —— day of ———, 190—.

THE ———— ORCHARD CO.,
Party of the First Part.

By ———— Agent.

Signature of purchaser ————,
Party of the Second Part.

As may be seen from this the owner of the land agrees to pay $180 for 112 apple trees, 18 pear and plum and 42 other plants including an assortment of small fruits. I have been assured by several reliable nurserymen in our state that this stock may be furnished at a profit, for less than $65. The owner, therefore, pays the balance, or $115 for the promise on the part of the company to prune and replace for five years.

We cannot call such a contract a humbug but when one who has studied these different plans and then compared them with straight prices offered by our substantial nurseymen, there can be but little doubt where to buy.

Conclusion.

As this report has been extended to undue length the conclusion should and will be brief. The year has been one of great encouragement. The Society membership has increased. If any mistake has been made it has been the assumption on the part of the members as a whole that the Society consists of the officers and executive committee when in fact it consists of the members thereof.

Let every member during the coming year devote but one hour of his time in securing new members or in preaching the gospel of horticulture, we may soon be the largest as we are now the strongest and most influential Society in the United States.

FINANCIAL REPORT OF SECRETARY.

RECEIPTS.

Refund from H. H. G. Bradt	$5 25
Refund from A. N. Kelley	1 00
Refund from M. S. Henry	2 00
Refund from Gimbels	5 85
Refund from Iowa State Hort. Society	19 12
Fruit sold	241 97
Vouchers for expenses	525 00
Membership fees and misc.	332 50
	$1,132 69

CREDITS.

By payments to Treas.	$226 75
By expenses as per accts. audited	837 43
Cash on hand	68 51
	$1,132 69

REPORT OF COMMITTEE ON AWARDS.

Your committee on awards has examined the fruit on exhibition and make the following awards.

Best Collection, D. E. Bingham, 1st; John Reis, 2nd; L. H. Palmer, 3d.
Best 4 Plates, winter, L. H. Palmer, 1st; A. N. Kelley, 2nd.
Best 3 Plates, winter, Henry Simon, 1st; L. H. Palmer, 2nd.
Best New Apple, A. J. Phillips, 1st; Mrs. Ramsey, 2nd.
Best Seedling Apple, A. J. Phillips, 1st; A. N. Kelley, 2nd.
Best Plate Avista, A. J. Phillips, 1st; D. E. Bingham, 2nd.
Best Plate Baldwin, A. N. Kelley, 1st; John Reis, 2nd.
Best Plate Ben Davis, John Reis, 1st; John Reis, 2nd.
Best Plate Dominion, D. E. Bingham, 1st.
Best Plate Eureka, A. J. Phillips, 1st.
Best Plate Fameuse, Henry Simon, 1st; Wm. Toole, 2nd.
Best Plate Gano, D. E. Bingham, 1st; John Reis, 2nd.
Best Plate Gideon, John Reis, 1st.
Best Plate Golden Russett, L. H. Palmer, 1st; Henry Simon, 2nd.
Best Plate Longfield, Wm. Toole, 1st; Henry Simon, 2nd.
Best Plate Malinda, A. J. Phillips, 1st; A. N. Kelley, 2nd.
Best Plate McIntosh, D. E. Bingham, 1st; D. E. Bingham, 2nd.
Best Plate McMahan, John Reis, 1st; D. E. Bingham, 2nd.
Best Plate Newell, Henry Simon, 1st; John Reis, 2nd.
Best Plate Northern Spy, E. D. Hopson, 1st; E. D. Hopson, 2nd.
Best Plate N. W. Greening, J. G. Buehler, 1st; H. H. Harris, 2nd.
Best Plate Perry Russett, Wm. Toole, 1st; W. A. Toole, 2nd.
Best Plate Pewaukee, A. N. Kelley, 1st; L. H. Palmer, 2nd.
Best Plate Plumb Cider, L. H. Palmer, 1st; Henry Simon, 2nd.
Best Plate Seek-no-further, Wm. Toole, 1st; E. D. Hopson, 2nd.
Best Plate Scott Winter, Wm. Toole, 1st; John Reis, 2nd.
Best Plate Sutton Beauty, D. E. Bingham, 1st; D. E. Bingham, 2nd.
Best Plate Talman, L. H. Palmer, 1st; John Reis, 2nd.
Best Plate Twenty Ounce, John Reis, 1st; John Reis, 2nd.
Best Plate Utter, J. G. Buehler, 1st; Henry Simon, 2nd.
Best Plate Walbridge, J. G. Buehler, 1st; L. H. Palmer, 2nd.
Best Plate Wealthy, J. G. Buehler, 1st; D. E. Bingham, 2nd.

Best Plate Windsor, J. G. Buehler, 1st; D. E. Bingham, 2nd.
Best Plate Wolf River, Frank Ovenden, 1st; Frank Ovenden, 2nd.
Best Peck N. W. Greening, John Reis, 1st; Wm. Toole, 2nd.
Best Peck Wealthy, D. E. Bingham, 1st; Henry Simon, 2nd.

We also desire to make honorable mention of a fine exhibit by M. C. Clarke of Madison of the following varieties of apples from the Hood River Valley, Oregon; Arkansas Black, Ortley, Newton Pippin and Spitzenburg, also commendable exhibits of grapes by G. W. Reigle and Geo. J. Kellogg.

L. G. KELLOGG,
Judge.

REPORT OF SECRETARY AS SUPERINTENDENT OF TRIAL ORCHARDS.

WAUSAU ORCHARD.

According to the plan adopted by the trial orchard committee the Wausau orchard was thoroughly cultivated in the spring and then seeded to clover and timothy. The trees are now so large that cultivation is no longer practical.

The orchard was carefully pruned in April especial attention being given to the plum orchard. The early or April spraying was omitted this year, but extra attention given to the two applications of Bordeaux, the first just following the falling of the petals and the second ten days later.

One of our prominent members who attended the convention of the Michigan Society less than a thousand years ago came home overflowing with enthusiasm about spraying. There he heard of sprayed orchards with less than 10 per cent of wormy fruit! Had he read carefully the reports of our own Society he would have learned that results no less remarkable have been secured every year for four years at Wausau. Last year I reported that less than one-tenth of one per cent of the apples were wormy and this statement was based on the result of a very close observation and examination of many bushels of different kinds. This year the results were equally remarkable, in

fact it was only by diligent search that a wormy apple could be found. The fruit was also remarkably free from scab.

A little neglect in the spraying work last spring resulted in one of the most striking demonstrations of the value of Bordeaux I have ever seen. A few of the trees which bore no fruit were but lightly treated at the first spraying and passed over entirely when spraying the second time. In August and September these trees could be distinguished readily and without reference to the crop by the yellowing and falling leaves the result of apple scab. It was easy to surmise what the general result would have been in respect to scabby apples if no spraying had been done.

Crop. The yield of apples was the biggest in the history of the orchard, many kinds being loaded to the breaking point. The kinds bearing a full (heavy) crop are as follows: Hibernal, Longfield, Wealthy, McMahan, Dudley, Peerless, Newell, Repka, Okabena, Patten, Dominion, and Malinda. It was the "off" year for Duchess and Wolf River; the half dozen or more Northwestern Greening trees remaining of the original planting bore a fair crop. While Wealthy is mentioned in the list it must be said that the fruit was small and in every respect inferior, for Wealthy. This variety has not done well at Wausau. The Malinda trees bore their first crop this year and it certainly was a full one; the trees could not well have borne more, there would have been no room for the fruit. Peerless also made a remarkable showing this year in quality of fruit borne.

The banner variety in point of yield was the Hibernal, the 38 trees yielding 375 bushels of apples; five bushels more would have given an average yield of 10 bushels per tree, trees 10 years old. The total yield of apples reported by the party who purchased the crop was 1,600 bushels, free from worm and scab.

The cherry crop was a failure this year as in past seasons. Some varieties of plums bore a fair crop, others nothing.

BARRON.

Two acres additional were planted this year making three acres in all. But few trees died outright as a result of winter conditions but as the season advanced many more (about 70) failed to make a satisfactory growth, and most of these will no doubt succumb before next spring. A large part of the loss

may be ascribed to quality of stock received, especially the plum stock. We hope for better success in this respect another year.

POPLAR.

The Poplar orchard has suffered severely during the past year. While but 33 apples and 12 cherry trees were re-set in the spring a large number that appeared alive early in the season have since died. Mr. Peterson's report dated November, 1907, shows 400 apple, 10 crab and 15 plum either dead or so far gone that re-planting will be necessary. The Trial Orchard Committee has given directions that only Hibernal, Wealthy, Duchess, Patten Greening and Longfield be used in replacing. This committee also decided on a system of tile draining a portion of the orchard which plan will be executed next summer.

MAPLE.

Two of the three acres in the Maple orchard were planted last spring, mostly apples, of the following varieties, Duchess, Wolf River, Hibernal, Wealthy, N. W. Greening, McIntosh, Fameuse, Scott, Transparent, Longfield, University, Iowa Beauty, Tolman, Utter and of plums and cherries the following: Surprise, Quaker, Rockford, Hammer, De Soto, Early Richmond.

MEDFORD.

The Medford orchard is now full, that is, all the ground covered by our lease has been planted. Less than a dozen trees were re-set last year.

NEW ORCHARDS.

Manitowoc.

In pursuance of the plan adopted by the executive committee two new orchards were established during the past season and a contract in sight for a third. These orchards are located at Manitowoc and Gays Mills.

At Manitowoc five acres have been leased from the trustees of the county asylum for the insane about two miles east of the city of Manitowoc.

Gays Mills.

Is a thriving village about half way up the Kickapoo Valley in Crawford county. The orchard, however, is not

located in the valley but nearly 300 feet above it and consists of five acres. In both cases the owner or lessor has agreed to furnish land rent free and also all labor necessary in planting, cultivating and spraying the orchard, the Society furnishing only the stock and superintendence. The crop to belong to the owner of the land.

At Manitowoc no farmer could be found who cared to enter into such a contract and it required three visits in the part of the committee to find a location when finally the county of Manitowoc took pity on us and leased us a portion of the county farm.

At Gays Mills the situation was entirely different. Here no difficulty whatever was experienced in finding a suitable location.

These newer orchards will be conducted wholly on a commercial basis and planted wholly to apples. But five kinds are to be planted, one acre of each. The following kinds were selected by the trial orchard committee: Wealthy, Northwestern Greening, McMahon, McIntosh and Newell.

Sturgeon Bay.

The third site is at Sturgeon Bay where a lease is in prospect for five acres of apple orchard planted ten years and generally neglected. The purpose is to cultivate and generally renovate this orchard so as to make it yield as good a crop as that of Mr. Bingham and other neighboring orchards. In this way it may prove an excellent object lesson and stimulate tree fruit growing. It also marks out an entirely new line of work for the Society. In the northern orchards we are testing the climate and the soil conditions. Farher south these have been tested and the results are known. The new orchards, therefore, will be merely for the purpose of demonstrating the possibilities in the field of apple growing.

That the planting of apple orchards on a market basis will prove profitable no one who is familiar with the conditions can doubt. For the third time in my annual report to this Society I will state my opinion that no more favorable conditions exist anywhere in the United States for the raising of apples for market than in Crawford county, Wisconsin. There may be other counties as good but none, all things considered, excel it. If this Society succeeds in any large measure in developing the resources of this section in fruit growing we will have fulfilled our obligation to the state in the best possible manner.

REPORT OF TRIAL ORCHARD COMMITTEE.

MR. D. E. BINGHAM.

As chairman of the Orchard Committee I will make a report on the orchards inspected in August.

Owing to the failure of the Railway Co. to get me to Eau Claire on schedule time I did not get to the Barron orchard.

Mr. Coe and myself were the only ones of the committee who could get away. We were, however, accompanied by our secretary and our former president, Dr. Loope and Mr. ——— from Minnesota, which we appreciated very much.

Mr. Coe reported the Barron orchard in good condition, trees all growing with very few exceptions.

Our Poplar orchard shows unfavorable conditions for orchard. The land is too wet and unless tile drained, I do not predict any great success there. The Duchess, Wealthy, McMahan, Transcendent, Hyslop, looking the best. Native plums appear to be doing very well. The portion of the orchard left in sod has already reached the climax of failure and can be devoted to something else soon. The orchard has been ridged some to give drainage but the results are very far from satisfactory as the trees were planted before the ridging and consequently were too deep and still in very wet heavy red clay.

I would suggest that if this orchard is to be drained that the Society get a release from all but five acres and drain that and take care of it a little better and show results which will be more satisfactory in many ways.

The Maple orchard appears in good condition for the first year. Some poor stock was planted in this orchard but its being on a well drained, sandy soil the conditions look favorable for the orchard.

The Medford orchard we found looking very good, with the exception of a few trees that are planted in the low part or ravine which runs through the orchard. This needs draining and a method of culture to get a little more humus in the soil.

Our last orchard to visit was the Wausau orchard. Here we found a good crop of fruit on the trees, and with but few exceptions the trees looking very good. Longfield and Wealthy showed

some poor foliage but not in all instances. Only where the apple canker had affected them badly. Some fire blight but not much. The Hibernal, Okabena, McMahan, Duchess appeared to be the best commercial varieties in this orchard. The apple canker appeared to be pretty well under control only a very few trees that we noticed any of the disease in its active state.

The plums in this orchard seem very much in need of pruning and cultivating if anything is to be expected from them.

Cherries only partially alive and a failure as far as fruit is concerned. They appeared to be affected with shot hole fungus or were on too wet soil.

DISCUSSION.

Mr. C. L. Pearson: May I have a minute's time? Ever since I have listened to the secretary's report, I have been sensible of a very glaring defect in that report. Mr. Cranefield and I are not a mutual admiration society, and we are not throwing bouquets at each other, but I know something about how that appropriation came to go through the legislature. It was through the untiring efforts of Secretary Cranefield. (Applause.) I know that he saw the great need of it and he made other people see the need of it and whenever that bill came before the committee for a hearing, Mr. Cranefield was there and any opposition that developed against it he was able to overcome and I wish at this time just to set that matter right and not allow Mr. Cranefield's innate modesty to do himself an injustice.

Mr. Reigle: I move that what has been said be embodied in the proceedings of the meeting.

The President: Our reporter has been busy all the time.

Mr. Reigle: I know, but we want to fix it so that it will not be cut out. Motion prevailed.

The secretary read the following letter:

MILWAUKEE, WIS., Feb. 3rd, 1908.

To Secretary Cranefield.

DEAR SIR: Enclosed find fee for membership. I hope that you will have a nice time. I am too old to come out in the cold.

Yours truly,

GEO. JEFFERY.

A motion by Mr. Toole that the secretary be instructed to send a word of fraternal greeting from this Society by telegram to Mr. Jeffery was carried by rising vote.

EVENING SESSION—FEBRUARY 4.

TREASURER'S REPORT.

L. G. KELLOGG, Treasurer.

In account with The Wisconsin State Horticultural Society.

1907	Receipts	Dr.
Feb. 5	To balance on hand	736 17
Feb. 19	To Loan German Nat. Bank	500 00
Mch. 9	To Loan German Nat. Bank	500 00
May 23	To Loan German Nat. Bank	500 00
July 9	To Annual Appropriation	8,000 00
July 9	To Rec'd from State Treas	111 00
Aug. 13	To Geo. D. Van Dyke L. membership	5 00
Sept. 11	To F. Cranefield Sale of Fruit	226 75
		$10,578 92
	By vouchers returned (Nos. 1 to 217 inclusive)	6,547 21
	To Balance on hand	4,031 71
		$10,578 92

(The detailed account of expenditures has been omitted from the printed report for economy of space. The complete report, covering several pages, has been filed with the Governor as required by law. A duplicate copy will be furnished to any member on application to the secretary, F. Cranefield.)

REPORT OF FINANCE COMMITTEE.

Having examined the books, vouchers and bills of the secretary and treasurer of the Wisconsin State Horticultural Society we are pleased to report that we find the same in good form and correct.

Respectfully submitted,

IRVING C. SMITH,
T. E. LOOPE,
C. L. RICHARDSON.

On motion of Dr. Loope the reports were adopted.

The election of officers being next in order, Mr. Reigle placed in nomination for president, Mr. R. J. Coe. There being no further nominations, the secretary was instructed to cast the unanimous ballot of the Society for Mr. Coe for president, which was done accordingly.

Mr. Hanchett placed in nomination Mr. D. E. Bingham for vice president, and the secretary was instructed to cast the ballot for Mr. Bingham.

Mr. L. G. Kellogg was then in the same manner unanimously elected to the office of treasurer.

A recess of ten minutes was then taken to allow the delegates from the local societies to nominate members for the executive committee. The following nominations were reported: First District, A. J. Smith; Second District, E. P. Sandsten; Third District, William Toole; Fourth District, C. L. Meller; Fifth District, H. C. Melcher; Sixth District, L. A. Carpenter, Seventh District, A. J. Philips; Eighth District, M. E. Henry; Ninth District, W. S. Hager; Tenth District, Irving Smith; Eleventh District, C. L. Richardson.

On motion of Dr. Loope, the secretary was instructed to cast the ballot of the Society for the names selected as members of the executive committee.

WEDNESDAY MORNING SESSION, FEBRUARY 5.

The President: The first thing to take up this morning is the reception of delegates from other states. Is Mr. Kirk here from Iowa?

Mr. Kirk (Iowa): The horticultural people of Iowa send their greetings to the brethern of Wisconsin by me, one of their members and they wish me to say that notwithstanding the discouraging year we have just had, that we still think that of all things good, particularly fruit, Iowa can produce the best, and we want to say that in the future more than in the past we are to be reckoned with in the markets of the country in the fruit line. 1907 was a bad year for Iowa. The south three-quarters of the state did not raise sufficient fruit for home consumption, owing to an unusually warm spell in the very early spring, followed by extreme cold and freezing at just the time when it ought to have warmed up. The northern part of the state was somewhat better off, as the warm spell did not prevail there quite so long and we had a respectable crop, but northern Iowa has never given the attention to fruit raising which it deserves or which it has received in the central and southern parts of the state and consequently the crop was quite light. We are not discouraged because we had one poor crop. We said a few unpleasant things about the weather and went on, planted our corn and fed our cattle and hogs and had something to live on just the same if we did not have apples and cider to wash it down. Iowa is indebted somewhat to Wisconsin for some good things, among which I believe is the Northwestern Greening, which if I mistake not, originated in Wisconsin. We were also indebted to Wisconsin at our last annual meeting in December for the presence of a very genial Doctor, whom you sent over there. We enjoyed the Doctor very much. The Doctor mentions our having thrown a number of bouquets to Mr. C. G. Patten, the Burbank of Iowa, but he failed to mention that concealed in one of these bouquets was a "long green" clearing house certificate, or its equivalent, to the amount of $1,000, and we gave that to Mr. Patten. We do not think that that by any means cancels our obligations to him. We appreciate Mr. Patten in Iowa, and I believe your people do also.

Prof. L. R. Taft (Mich.): I am hardly here as a delegate and in fact I hope you will have with you before the meeting closes a regular delegate from our Society. I know our secretary has asked one or two to attend, and I was told that one of them would be here, but as he may not come, I am very glad to offer the greetings of our Society to you. We have been favored in the past years by a number of your members and have always enjoyed having them with us and for myself, and I know I can speak for the others who have been across the lake, we have always enjoyed coming to Wisconsin. When I found the meeting would be at Madison, I was particularly glad to avail myself of the opportunity to come. We have had all kinds of mishaps in Michigan. I think we owe part of our troubles to Wisconsin. I know that in October, 1906, some of your playful zephyrs must have got away, they jumped over the state there and settled down right in the heart of our fruit belt and as a result they killed several millions of our peach trees, and I can only think it must have been the effect of your cold zephyrs that came over there and killed them, because it was the first time we ever had anything of that kind, and I hope it will be the last. But when we consider the northern half of Michigan, I might say we had I think the best season ever known. We had very large crops of apples, peaches, cherries and large crops of quite a number of other fruits. When it came to apples, peaches and cherries, it was the largest crop we ever had and the crop being destroyed for the most part in southern Michigan, of course we had very good prices, so that the fruit growers in the northern half are well pleased and I am glad to say the apple growers in southern Michigan had perhaps the best crop they ever grew where they took care of the trees, but the men who did not give their trees proper care had practically no crop and what they did have is practically worthless. That showed very well what care will do for an orchard. But we hope for better luck during the coming year. Everything seems favorable. Let me say that our Society is certainly surprising. The last three or four meetings have been the best we have ever had. The best perhaps was at Battle Creek last December and we have had calls from all over the state for meetings of the Society, and we shall have one week after next in the eastern part of the state, and we hope you will come over

there. You can see there what Michigan can do in the way of apple orchards at least and we hope to have some of our fruit on exhibition.

The President: We have a Northern Illinois man with us, Mr. Hey. We will be glad to hear from him in place of their regular delegate.

Mr. Hey: I am glad to be with you; sorry, however, for your sake, that our regular delegate could not be here, as I know that he can do better than I can in every respect. We had a very cold, backward spring after a very warm March that brought out the buds so that the pink of the blossom showed on the surface, and then twenty-eight nights of freezing early in April, that pretty nearly fixed our fruit so that we never got a taste of a plum nor an apple, or a cherry, or anything of that kind, in that country, except a few peaches that we managed to get through, something that nobody seems to be able to account for. I was lucky enough to have a few peach trees and we had an abundant supply of peaches for our own use and a few which we sold, which brought as high as seven dollars a bushel, so that you can see that home grown peaches down there are a luxury, being Champion peaches they were very fine. I wish to assure you that we feel very much under obligations to the Wisconsin Society down there. We have a saying there that the Wisconsin Society is a live and up-to-date Society and it is a good criterion for us to go by.

Mr. Andrews, delegate from Minnesota spoke briefly.

On motion of Dr. Loope, the delegates from other states and members of other state societies who were present were made honorary annual members of the Society. On motion of Mr. Toole, Prof. Taft, Mr. Wm. A. Taylor and Mr. Kollock were made honorary annual members of the Society.

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General view of the chrysanthemum show at Lake Geneva, Wis., Nov., 1908. Under the auspices of the Lake Geneva Gardeners' and Foremen's Association.

ANNUAL REPORT

OF THE

Wisconsin State Horticultural Society

FOR THE YEAR 1909

VOL. XXXIX

F. CRANEFIELD, Secretary
MADISON, WIS.

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1909

LETTER OF TRANSMITTAL.

MADISON, WIS., March 1, 1909.

To His Excellency, JAMES O. DAVIDSON,

Governor of Wisconsin.

DEAR SIR:—I have the honor to transmit to you herewith the Thirty-ninth Annual Report of the Wisconsin State Horticultural Society.

Respectfully,

FREDERIC CRANEFIELD,

Secretary.

TABLE OF CONTENTS.

CONSTITUTION.

Article 1. This Society shall be known as "The Wisconsin State Horticultural Society" and its location shall be at the city of Madison, Dane County, Wisconsin where its principal office shall be maintained.

Article 2. The object of this Society shall be the advancement of the art and science of horticulture throughout the state.

Article 3. This Society is formed without capital stock.

Article 4. This Society shall consist of life members, annual members, honorary life members and honorary annual members. Life members shall pay a fee of five dollars for such membership. Annual members shall pay an annual fee of 50 cents, except paid members of local horticultural societies who shall pay an annual fee of 25 cents for such membership; wives of such members shall be entitled to the privileges of full membership.

Honorary annual members may, by vote, be elected and invited to participate in the proceedings of the Society. Honorary life members shall be elected by vote of the Society, and shall be distinguished for special merit in horticulture and kindred sciences, or shall confer some particular benefit upon the Society.

Article 5. The general officers of the Society shall be a President, Vice President, Secretary, Treasurer and an Executive Committee, consisting of the foregoing officers and one additional member from each congressional district; a majority of whom shall constitute a quorum at any of its meetings.

The officers aforesaid, except the Secretary shall be elected, by ballot, at the annual meeting, and shall hold office for one year thereafter and until their respective successors are elected. The Secretary shall be appointed by the Executive Committee at its annual meeting after the election of officers and shall hold office for one year thereafter or until his successor is appointed.

Article 6. The principal duties of the general officers shall be as follows:—

The President shall preside at all meetings of the Society and of the Executive Committee, shall exercise a general supervision and

control of the business and affairs of the Society, and shall sign all leases, deeds and instruments for the transfer, conveyance or assignment of the corporate property, and all contracts, papers and instruments necessary or convenient in the transaction of the business of the Society, and when necessary, acknowledge the same.

The Vice President shall act as President in case of the absence, disability or removal of the President.

The Secretary shall conduct the general correspondence of the Society and keep a record of the business and of the proceedings at all meetings of the Society and of the Executive Committee; he shall keep, safely and systematically all books, records, papers and documents belonging or pertaining to the Society or the business thereof; he shall countersign all deeds, leases and conveyances, and, when necessary, acknowledge the same.

The Treasurer shall receive and safely keep all moneys, notes, securities and property of the Society which may come into his hands and shall pay out or dispose of the same only upon such terms and conditions as the Executive Committee may direct or the by-laws provide. He shall keep a correct account of all moneys received and disbursed and shall render such account of the same as shall be required by the Executive Committee or prescribed in the by-laws. And he shall execute a bond to the Society, in such sum, and with such sureties as the Executive Committee shall approve, conditioned upon the faithful performance of his duties, and for the payment and delivery to his successor of all the money and property of the Society in his hands or under his control; which bond when approved shall be filed with the Secretary.

The said officers shall perform such other or additional duties as may be required and any of the duties and powers of said officers may be performed or exercised, so far as is lawful, by such other officers, persons or committees as the Executive Committee may provide.

Article 7. The members of the Executive Committee from the several congressional districts shall be chosen by the delegates of their respective county or local societies present at the annual meeting of this Society, or in case of the absence of delegates from such societies or in case of failure to elect, such members shall be chosen from among the members of this Society present from such districts. But if any district is not represented the vacancy shall be filled by vote of the members of this Society present at the annual meeting.

Article 8. The term "county and local horticultural societies" shall include any organization that shall have for its object the advancement of the interests of its members in the growing or sale of horti-

cultural crops; provided that such society acts by authority of a regularly adopted constitution and makes an annual report to the Secretary of the state society.

Article 9. The Society shall hold its annual meeting for the election of officers, exhibition of fruits, and discussions, in the city of Madison, Wisconsin. Other meetings shall be held at such time and place as the Executive Committee may direct.

Article 10. Only persons holding memberships according to the regulations of the Society shall be members of it.

Article 11. This Constitution, with the accompanying by-laws, may be amended, at any regular meeting of this Society by a two thirds vote of the members present; provided that such amendment is presented in writing.

RULES AND BY-LAWS

Article I.—Membership.

Sec. 1. The Secretary shall decide upon all applications for membership in accordance with the Constitution and By-Laws of the Society.

Sec. 2. Any member maliciously or intentionally injuring or working in opposition to the Society or its purposes in promoting horticulture may upon return of his membership fee be summarily expelled.

Article II.—Meetings.

Sec. 1. The Executive Committee may fix the time and place for holding the annual meeting of the Society, if the last meeting thereof failed to do so and may call such meeting by giving at least thirty days notice to each member. Such notice shall be given by the Secretary, by mailing the same, postage prepaid, to each member at his last known address.

Sec. 2. Notice of a special meeting shall be mailed to each member at his last known address by the Secretary at least six days before such meeting is to be held. Such notice shall state the business to be transacted and the date, hour and place of meeting, and no business other than that stated in the notice shall be considered at such meeting.

Article III.—Duties of Officers—The President.

Sec. 1. The President shall preside at all meetings of the Society and of the Executive Committee; he shall, with the advice of the Secretary, call all meetings of the Society if the Executive Committee fail so to do; he shall appoint the delegates to the meetings of other State Horticultural Societies; he shall have a general supervision of the business and affairs of the Society, and he shall deliver an annual address upon some subject connected with horticulture.

Sec. 2. He shall sign and acknowledge all leases, deeds, and instruments for the conveyance or transfer of the Society's property,

and all other contracts, papers and instruments necessary or convenient in transacting its business.

Sec. 3. He shall sign all orders drawn on the Treasurer for the payment of bills, accounts and claims audited by the Board of Managers and none other.

Sec. 4. In case of the absence from any cause of both the President and Vice President the members present, if a quorum, shall elect one of their number temporary president.

Article IV.—The Secretary.

Sec. 1. The Secretary shall attend to all the correspondence of the Society; he shall keep a correct and complete record of the business and of the proceedings at all meetings of the members and of the Executive Committee.

Sec. 2. He shall superintend the publication of the Reports of the Transactions of the Society and publish or cause to be published such special bulletins on timely and appropriate subjects and such special reports of the condition and results of experimental work in the Trial Orchards and Trial Stations as the Board of Managers may direct.

Sec. 3. He shall present a detailed report of the affairs of the Society at its annual meeting. He shall endeavor to secure reports from the various committees, and from local societies, of the condition and progress of horticulture throughout the state and report the same to the Society. It shall be his duty to make a report to the Governor of the State of the transactions of the Society according to the provisions of the statutes for state reports.

Sec. 4. He shall be Superintendent of all Trial Orchards and Trial Stations. In that capacity he shall supervise the planting and cultivation of, and exercise general control over, the same subject to the directions of the Trial Orchard Committee.

Sec. 5. He shall engross in the general record book of the Society a true copy of the Constitution Rules and By-Laws, and all amendments thereto and all resolutions of the Society and of the Executive Committee.

Sec. 6. He shall keep a record book in which shall be entered the names of all members of the Society from its organization, the place of residence, time of acquiring membership and time of cessation of same.

Sec. 7. He shall notify all persons elected to office within ten days thereafter if such persons were not present at the election.

Sec. 8. He shall keep a book in which a correct list of the property of the Society shall be entered. He shall draw all orders, checks, etc.,

ordered by the Executive Committee or Board of Managers and countersign the same when signed by the President.

Sec. 9. He shall keep a stub or record of all orders, checks, etc., drawn and delivered, showing the date and amount thereof and to whom and for what purpose the same was issued.

Sec. 10. He shall receive all fees for membership, give proper receipts for the same, and, unless otherwise directed by the Executive Committee, shall pay the money to the Treasurer taking his receipt therefor.

Article V. The Treasurer.

Sec. 1. The Treasurer shall, before entering on the duties of his office execute a bond to the Society in such sum and with such sureties as the Executive Committee may direct conditioned as provided in the Constitution.

Sec. 2. He shall receive and be responsible for the safe keeping of all money, notes, securities, credits, etc., of any and every nature, belonging to the Society which shall come to his hands.

Sec. 3. He shall keep proper books of account and a true and complete record of all business transacted by him for the Society; he shall keep proper vouchers for all money disbursed and shall render such accounts and statements of the moneys received, disbursed and on hand, and generally of all matters pertaining to his office as the Executive Committee may require or the By-Laws direct.

Sec. 4. He shall disburse the money of the Society only on the written order of the President countersigned by the Secretary, and shall make an annual report of the receipts and disbursements and furnish the Secretary with a copy of the same on or before the first day of the Annual meeting.

Article VI. The Executive Committee.

Sec. 1. The Executive Committee shall have the general care and management of the property affairs and business of the Society, and a majority of its members shall constitute a quorum. The President and Secretary of the Society shall be President and Secretary of the Executive Committee.

Sec. 2. Meetings of the Committee may be called by the President, the Secretary, or by the Secretary on the written request of five members.

Sec. 3. They shall fix the amount of the Treasurers' bond, the number of his sureties and approve the same. They may require any other

Peonies.

officer, agent or employee of the Society to execute a bond and prescribe the amount and conditions thereof, and approve the same.

Sec. 4. They may prescribe such salary or compensation for any officer, agent, or employee of the Society as they may deem proper, but not for a longer term than until the next annual meeting of the members, nor shall any officer of the Society be entitled to or receive any benefit, salary or compensation for, on account of, or during the time that he may be absent beyond the boundaries of the state unless such absence was at the request and on behalf of said Society.

Sec. 5. The Executive Committee shall have the power to remove any officer for official misconduct or neglect of the duties of his office. In case of vacancy in any office, either by resignation, removal or otherwise, such vacancy may be filled by appointment by the said Committee, but such person shall hold office only for the unexpired portion of the term.

Sec. 6. The Executive Committee shall make such rules and regulations for the conduct of the business of the Society, not inconsistent with law, the Constitution, or the Rules and By-Laws, as they shall deem expedient and for the best interests of the Society.

Article VII. Committees.

Sec. 1. The President, Treasurer and Secretary shall constitute a Board of Managers which may conduct any business deemed necessary for the Society in the absence of the Executive Committee. All bills against the Society must be audited by the Board of Managers before being paid.

Sec. 2. Regular meetings of the Board of Managers shall be held bi-monthly to audit accounts and transact other business; special meetings may be called by any member of the Board.

Sec. 3. The President shall annually appoint the following standing committees—

Committee on Finance of three members, and one member of the committee on Trial Orchards and Trial Stations, of three members, to be appointed for a term of 3 years, and such other committees as may from time to time be necessary.

Sec. 4. It shall be the duty of the Finance Committee to settle with the Treasurer and to examine and report upon all bills and claims against the Society which may have been presented and referred to them, provided, however, that no member of the Executive Committee shall be a member of the Finance Committee aforesaid.

Sec. 5. The Trial Orchard Committee shall have general control of the locating, planting and care of all trial orchards and trial sta-

tions, and may visit collectively each orchard and station once each year or oftener if deemed necessary. Meetings of the Committee may be called at any time by the President of the Society or by the Superintendent of Trial Orchards.

Article VIII.—Miscellaneous.

Sec. 1. The foregoing Rules and By-Laws shall take effect and be in force from the date of their adoption.

MEMBERSHIP ROLL

LIFE MEMBERS.

Wisconsin State Horticultural Society.

Allis, Frank W. ..... Madison
Ames, W. L. ..... Oregon
Ayer, Ed. C. ..... Fontana
Auer, Mrs. Louis ..... Milwaukee
Babcock, O. W. ..... Omro
Barnes, A. D. ..... Waupaca
Bussey, W. P. ..... Omro
Buckstaff, D. C. ..... Oshkosh
Brown, F. G. ..... Madison
Barnett Bros. ..... Chicago, Ill.
Buehler, J. G. ..... Richland Center
Bingham, D. E. ..... Sturgeon Bay
Burnham, O. J. ..... Richland Center
Chappel, F. H. ..... Oregon
Chandler, S. S., Jr. ..... Waupaca
Cole, W. B. ..... Pleasant Prairie
Converse, D. C. ..... Ft. Atkinson
Carpenter, L. A. ..... Fond du Lac
Coe, R. J. ..... Ft. Atkinson
Carver, N. E. ..... Bayfield
Cashman, Thos. E. ..... Owatonna, Minn.
Chapin, S. B. ..... Lake Geneva
Cleermans, Aug. ..... Green Bay
Dunn Co. School of Agr. & Domestic Economy ..... Menomonie
Eaton, B. A. ..... S. Milwaukee
Edwards, F. C. ..... Ft. Atkinson
Foley, M. F. ..... Baraboo
France, N. E. ..... Platteville
Freeman, Roy F. ..... Racine
Freeman, G. A. ..... Sparta

Fiebing, J. H. ..... Milwaukee
Fancher, W. E. ..... Corliss
Fieldhouse, Wm. ..... Dodgeville
Gifford, G. P. ..... Madison
Guilford, W. S. ..... Pecatonica, Ill.
Hager, W. S. ..... West Depere
Harden, F. A. ..... Weyauwega
Harland, F. W. ..... Milwaukee
Herbst, J. L. ..... Sparta
Hudnall, Geo. B. ..... Superior
Hutchinson, C. L. ..... Lake Geneva
Harris, N. W. ..... Lake Geneva
Hanchett, W. H. ..... Sparta
Hildemann, E. S. ..... Belleplain
Hatch, A. L. ..... Sturgeon Bay
Henry, M. E. ..... Oshkosh
Jones, G. D. ..... Wausau
Jones, John D. ..... Elk Grove
Joys, A. M. ..... Milwaukee
Johnson, Franklin ..... Baraboo
Johnson, Chas. G. ..... Clintonville
Kellogg, L. G. ..... Ripon
Kellogg, M. S. ..... Janesville
Kierstead, E. H. ..... Lake View, Mich.
Kreutzer, A. L. ..... Wausau
Koehler, John ..... N. Milwaukee
Kremers, Prof. E. ..... Madison
Knight, Wm. ..... Bayfield
Krienetz, Alfred J. ..... Milwaukee
La Follette, Robt. M. ..... Madison
Lathrop, Rev. Stanley E. ..... Ashland
Loop, A. I. ..... North East, Penn.
Loope, Dr. T. E. ..... Eureka
Lyon, Jay F. ..... Elkhorn
Larson, W. E. ..... Manitowoc
Marshall, S. H. ..... Simeon, Va.
Malde, O. G. ..... Madison
Manitowoc Seed Co. ..... Manitowoc
McGregor, E. L. ..... Appleton
Maxson, O. P. ..... Waukegan, Ill.
Melville, Jas. W. ..... Chippewa Falls
Melcher, H. C. ..... Oconomowoc

McGovern, Wm. P. ..... Cedarburg
Magnussen, Peder ..... Augusta
Nantz, Henry E. ..... Sauk City
Nelson, J. C. ..... Green Bay
Olesen, Janes P. ..... Ripon
Orr, E. D. ..... Mt. Hope
Peck, Chas. G. ..... Sheboygan Falls
Pollworth, C. C. ..... Milwaukee
Palmer, L. H. ..... Baraboo
Plumb, Wm. H. ..... Madison
Pirner, John ..... Waukesha
Palmer, J. S. ..... Baraboo
Ruste, C. O. ..... Blue Mounds
Ryerson, M. A. ..... Lake Geneva
Rentschler, F. ..... Madison
Raymer, Geo. ..... Madison
Riordan, D. E. ..... Ashland
Rosenow, H. E. ..... Oconomowoc
Richardson, E. A. ..... Sparta
Richardson, C. L. ..... Chippewa Falls
Rounds, Wm. ..... Baraboo
Seubert, Rev. John ..... Cologne, Minn.
Steele, W. H. ..... Pewaukee
Smith, Irving C. ..... Ashland
Smith, Silas S. ..... Crandon
Salter, Walter N. ..... Seattle, Wash.
Saxe, Arthur ..... Whitewater
Simon, H. ..... Baraboo
Smith, Geo. B. ..... Green Bay
Schuette, Aug. ..... Manitowoc
Simonson, Arthur ..... Racine
Schroeder, Mrs. F. J. ..... Milwaukee
Salzer, John A. Seed Co. ..... La Crosse
Smith, A. J. ..... Lake Geneva
Taylor, Will L. ..... Mt. Hope
Tilson, Mrs. Ida E. ..... West Salem
Toole, W. A. ..... Baraboo
Toole, Wm. ..... Baraboo
Tifft, Geo. L. ..... Milwaukee
Treleven, Jos. D. ..... Omro
Tittemore, J. N. ..... Oshkosh
Underwood, Roy ..... Lake City, Minn.

Underwood, J. M. ..... Lake City, Minn.
Van Dyke, Geo. D. ..... Milwaukee
Vaughn, B. ..... Grand Rapids
Webb, W. H. ..... Superior
Williams, Daniel ..... Oconomowoc
Wright, Arthur ..... Milwaukee
Williams, Norman G. ..... Shiocton

HONORARY LIFE MEMBERS.

Bailey, Prof. L. H. ..... Ithaca, N. Y.
Case, F. W. ..... Chicago, Ill.
Hinckley, M. E. ..... Mt. Vernon, Ia.
Kellogg, Geo. J. ..... Lake Mills, Wis.
Patten, C. G. ..... Charles City, Ia.
Periam, Jonathan ..... Chicago, Ill.
Phoenix, F. H. ..... Delavan, Wis.
Phillips, A. J. ..... West Salem, Wis.
Trelease, Prof. Wm. ..... St. Louis, Mo.

ANNUAL HONORARY MEMBERS.

Clark, Miss Calista ..... Ashland
Cook, C. B. ..... Owosso, Mich.
Cowles, Mrs. Wilbur ..... Baraboo
Harper, Miss Blanchard ..... Madison
Hey, Chas. ..... Dixon, Ill.
Herbert, Marie ..... Chippewa Falls
Livingston, Prof. J. W. ..... Platteville, Wis.
Nelson, M. O. ..... Minneapolis, Minn.
Riehl, Edwin H. ..... North Alton, Ill.
Smith, Mrs. Irving ..... Ashland, Wis.
Smith, E. A. ..... Lake City, Minn.
Tippin, Geo. T. ..... Springfield, Mo.
Treleven, Mrs. Jos. ..... Omro, Wis.
Young, Miss Ellen ..... Chippewa Falls, Wis.

ANNUAL MEMBERS.

Adamson, Mrs. C. F. ..... Madison
Alexson, A. ..... Sparta
Allen, Jas. ..... Knowiton
Anderson, J. P. ..... Ashland
Aznoe, John ..... Detroit Harbor
Allen, J. B. ..... Dallas
Athearn, Mrs. J. ..... Oshkosh
Abbott, Wm. ..... Ft. Atkinson
Ascott, Wm. ..... Sparta
Amond, Phillip ..... Gillette
Allen, M. T. ..... Waupaca
Ashby, H. M. ..... Pullman Sta., Chicago, Ill.
Anderson, Peder ..... Poysippi
Athearn, L. J. ..... Oshkosh
Bennett, Wm. F. ..... Chicago, Ill.
Brigham, Chas. I. ..... Blue Mounds
Brown, A. D. ..... Baraboo
Brown, A. D. ..... Poplar
Bennett, A. E. ..... Grand Rapids
Briggs, Newton ..... Madison
Brainerd, C. P. ..... Boscobel
Baker, H. J. ..... Fond du Lac
Bathrick, D. D. ..... Chicago
Brown, C. L. ..... New York, N. Y.
Button, A. A. ..... Sturgeon Bay
Bennett, A. C. ..... Grand Rapids
Baldwin, Herbert ..... Mountain
Bock, J. A. ..... Manitowoc
Boyles, C. L. ..... Lake Geneva
Bridge, H. H. ..... Shiocton
Barden, W. F. ..... Wauwatosa
Barnes, Geo. F. ..... Milwaukee
Bohn, B. L. ..... Wonewoc
Boerner, A. F. ..... Cedarburg
Berger, Ole H. ..... Chetek
Barton, W. E. ..... Barron
Burg, E. F. ..... Duluth, Minn.
Bolstad, John ..... Hillsdale
Beckwith, Howard W. ..... Lake Geneva
Birmingham, Avery ..... Sturgeon Bay

Birmingham, Eugene ..... Sturgeon Bay
Birmingham, Oscar ..... Sturgeon Bay
Babcock, Chas. L. ..... Milwaukee
Barnes, R. W. ..... Waupaca
Borum, G. R. ..... Barron
Bagnall, R. T. ..... Sturgeon Bay
Bassett, Arthur K. ..... Baraboo
Blumer, Fred ..... Monticello
Block, Albert F. ..... Markesan
Beck, Peter C. ..... Racine
Borst, John ..... Red Granite
Bingham, R. O. ..... Sturgeon Bay
Beck, Christ ..... Oshkosh
Braen, Mithias ..... Alma
Cooper, H. O. ..... Montello
Cantwell, F. W. ..... Madison
Cooke, W. D. ..... Green Bay
Curtis, Geo., Jr. ..... Madison
Carpenter, Mary ..... Madison
Carey, C. H. ..... Redgranite
Crawford, M. ..... Cuyahoga Falls, Ohio
Crowley, John ..... Sparta
Currie, James ..... Milwaukee
Crawford, John ..... Oconto
Christensen, A. H. ..... Almond
Christensen, H. C. ..... Oshkosh
Coldwell, John ..... Mazomanie
Cheek, A. P. ..... Baraboo
Clark, M. C. ..... Madison
Carey, J. E. L. ..... Redgranite
Carlson, F. O. ..... Hillsdale
Calkins, Hugh ..... Antigo
Case, Walter ..... Rice Lake
Carey, W. H. ..... Grand Rapids
Christoffer, Harry J., Jr. ..... London
Carter, Mrs. Eva ..... Poynette
Conrad, Albert ..... Waukesha
Cole, V. ..... Mountain
Cheeseman, F. W. ..... Sturgeon Bay
Crossman, P. H. ..... Baraboo
Conkle, Byron ..... Arlington
Cooley, E. J. ..... Easton

Doty, E. P. ..... Janesville
Delwiche, Ed. ..... Ashland
Doherty, E. G. ..... Maple
Daub, C. H. ..... Eau Claire
Dey, Scott S. ..... Wyocena
Dunning, E. E. ..... Milwaukee
Deuchart, Geo. L. ..... Green Bay
Davis, Ward ..... Oshkosh
Dean, H. F. ..... Whitewater
Doty, Frank ..... Egg Harbor
Donnelly, Jas. ..... Mauston
Dillon, W. E. ..... Butternut
Dreier, Herman ..... Cedarburg
Doerr, Geo. ..... Milwaukee
Detjen, L. R. ..... Algoma
Davis, Henry R. ..... Poysippi
Du Bois, E. A. ..... Oshkosh
Davis, J. A. ..... Hartland
Dunning, E. C. ..... Milwaukee
Emery, L. J. ..... Marshfield
Evenson, Jos. T. ..... Iola
Engsberg, Conrad ..... Lake Mills
Ferguson, T. J. ..... Wauwatosa
Floyd, Mrs. S. G. ..... Eureka
Fish, L. N. ..... Sparta
Fish, Elbert J. ..... Sparta
Fitch, W. H. ..... Cranmoor
Fargo, Mrs. Enoch J. ..... Lake Mills
Filkins, C. B. ..... Bangor
Fenlon, E. W. ..... Waukesha
Fisher, A. F. ..... Baraboo
Falge, Mrs. Louis ..... Manitowoc
Fadner, Paul ..... Chilton
Flanagan, W. H. ..... Argyle
Felix, Geo. ..... Prairie du Sac
Follstad, Anton ..... Elcho
Feuerstein, J. ..... Sturgeon Bay
Fadness, Mrs. Allie ..... Doylestown
Fleming, J. R. ..... Merrimac
Falarsh, Frank ..... Peshtigo
Gabriel, H. ..... Blanchardville
Gilles, Peter ..... Milwaukee

Gilley, Albert ..... Stoughton
Gonzenbach, Ernest ..... Sheboygan
Gentle, Geo. R. ..... Janesville
Grape, John ..... Waukesha
Goldfarb, S. ..... Baraboo
Grant, B. H. ..... Monico
Gerbracht, J. H. ..... Spring Grove, Ill.
Goedjen, Henry ..... Manitowoc
Gaynor, J. A. ..... Grand Rapids
Gillen, Dr. F. C. ..... Milwaukee
Goodnow, E. W. ..... Lansing, Mich.
Gilbert, R. W. ..... Sturgeon Bay
Graase, Frank N. ..... Sturgeon Bay
Goff, Moulton ..... Madison
Gorski, Mike ..... Milwaukee
Grasselli Chemical Co. ..... Milwaukee
Gardner, E. J. ..... West Depere
Griffin, Joseph A. ..... Madison
Harris, S. H. ..... Medford
Howie, John ..... Waunakee
Hatch, C. A. ..... Richland Center
Hatch, L. M. ..... Big Bay, Mich.
Hahn, H. J. ..... Sturgeon Bay
Hodge, W. A. ..... Waunakee
Harper, C. L. ..... Madison
Harris, H. H. ..... Warrens
Huntley, Mrs. ..... Cuprum, Idaho
Howlett, Mrs. D. D. ..... Oshkosh
Holmes, J. B. ..... Walworth
Hinrichs, Ernest ..... Reedsburg
Hood Bros. ..... Baraboo
Hirsch, B. ..... Washburn
Hopkins, A. W. ..... Madison
Harmon, Harry ..... Madison
Haentz, E. ..... Fond du Lac
Hegtvedt, E. S. ..... Chetek
Heider, H. W. ..... Barron
Hoesley, Henry ..... Turtle Lake
Howard, J. A. ..... Hammond, Minn.
Hickok, J. W. ..... Cameron
Houltman, Jno. ..... High Bridge
Hale, O. C. ..... Tunnel City
Hill, Geo. C. ..... Rosendale

Hield, N. E. ..... Janesville
Hatch, M. W. ..... Sturgeon Bay
Hahn, Michael ..... Sturgeon Bay
Hackett, Geo. W. ..... N. Freedom
Hanson, John ..... Sturgeon Bay
Halverson, Melvin E. ..... Argyle
Hebron, W. W. ..... Sparta
Hoerres, Frank ..... Milwaukee
Hillier, B. S. ..... Sparta
Huss, Geo. M. ..... Minneapolis
Howe, Jas. R. ..... Milwaukee
Hamlyn, W. W. ..... West Bend
Ihrig, J. J. ..... Oshkosh
Irwin, R. A. ..... Lancaster
Isaacson, Chas. ..... Poplar
Isom, R. A. ..... Madison
Jeffrey, Geo. J. ..... Milwaukee
Jones, Geo. G. ..... Neenah
James, P. T. ..... Bloom City
Jorgenson, Geo. ..... Poysippi
Jordan, Mrs. E. ..... Antigo
Johnson, Hans J. ..... Osseo
Jones, E. E. ..... Rockland
Jones, Mrs. A. C. ..... Eureka
Jackson, C. H. ..... Oconomowoc
Jacob, Nic. C. ..... Sawyer
Jacob, Edward ..... Sawyer
Jones, Geo. H. ..... Oshkosh
Kelly, A. N. ..... Mineral Point
Kieffer, M. ..... Fredonia
Kauffman, H. ..... Marshfield
Klosowski, Rev. M. ..... Plover
Kull, Andrew ..... Lake Geneva
Kruschke, J. W. ..... Cranberry Center
Kampen, H. W. ..... Poynette
Kirwan, Michael ..... Manitowoc
Kneser, J. ..... Barrington, Ill.
Kiloy, Daniel ..... Twin Bluffs
Koschin, Gustav ..... Milwaukee
Knox, James ..... Alpena, S. D.
Koepp, W. R. R. ..... Barron
Knutson, O. ..... Eau Claire
Kahl, Otto ..... Prairie Farm
Klann, Wm. E. ..... Milwaukee

Koegel, Alois ..... East Milwaukee
Kraut, Otto ..... Milwaukee
Knutson, E. L. ..... Wautoma
Kellogg, W. E. ..... Solon Springs
Kellogg, Karl M. ..... Solon Springs
Leverich, J. W. ..... Sparta
Loewe, Arthur P. ..... Milwaukee
Larkin, Danford ..... Sturgeon Bay
Lemon, R. K. ..... Mitchelville, Iowa
Laue, A. F. ..... Milwaukee
Lenicheck, F. J. ..... Milwaukee
Larson, Martin ..... Sparta
Lasche, A. ..... Milwaukee
Lohberger, Albert ..... Bennett
Loewe, Ed. C. ..... Milwaukee
Laird, Alex. ..... Shiocton
Leonard, Wm. ..... Jefferson
Lippold, John W., Sr. ..... Milwaukee
Lillesand, L. E. ..... Cambridge
Lee, Robert G. ..... Tomahawk
Louther, Mrs. Martha ..... Eureka
Lugg, James ..... Union Grove
Lathrop, A. T. ..... Madison
LaFay, Will ..... Stoughton
Lehmann, Mrs. A. W. ..... Woodland
Moyle, W. J. ..... Union Grove
Muller, Miss E. T. ..... Waukesha
Mueller, Wm. E. ..... De Forest
Mason, E. L. ..... Hillsboro
Mack, S. B. ..... Monroe
Moore, J. G. ..... Madison
Muhlenkamp, Fred ..... Sparta
Marsh, H. F. ..... Antigo
Mische, E. T. ..... Portland, Oregon
Marken, Otis ..... Valders
Meller, C. L. ..... Fargo, N. D.
Mallory, N. V. S. ..... Shiocton
Marsh, W. H. ..... Antigo
Melcher, W. S. ..... Hartford
Moore, Henry G. ..... Mauston
Moore, V. V. ..... Baraboo
Marshall, J. B. ..... Poynette
Miller, A. A. ..... Ashland
Mulligan, Mack ..... Barron

Moran, Mrs. John.....Omro
Marshall, W. E. .....Sturgeon Bay
Miles, J. J. .....Ashland
Marken, Richard L. .....Valders
Moffatt, Jno. .....Poysippi
Mair, Frank P. .....Milwaukee
McKay, W. G. .....Pardeeville
McLay, Geo. R. .....Janesville
McMahon, W. O. .....Arkansaw
McGaffey, Ancil .....Meadow Valley
McLeod, J. N. .....Platteville
McCance, Wm. J. .....Sparta
McCue, O. E. .....Poysippi
Noyes, J. B. .....Oshkosh
Naud, Geo. R. .....Gordon
Nienaber, B. H. .....Manitowoc
Nelson, Wm. .....Oshkosh
Ovenden, Frank .....Madison
Oakley, Mary .....Madison
O'Brien, Ellsworth .....Auburndale
Otis, B. F. .....Sturgeon Bay
Oviatt, Dr. C. W. .....Oshkosh
Otterhalt, Henry .....Chetek
Pearson, C. L. .....Baraboo
Peterson, P. A. .....Poplar
Paige, Mrs. W. S. .....Madison
Pfefferle, S. .....Appleton
Pederson, C. T. .....Prairie Farm
Pelton, Geo. .....Reedsburg
Post, Lawrence .....Mt. Horeb
Pfaender, Wm., Jr. .....New Ulm, Minn.
Powell, A. W. .....Lead, S. D.
Pederson, Peter .....Eleva
Port, Mike .....Grafton
Pelton, M. .....Reedsburg
Plumb, C. M. .....Lesterville, S. D.
Parks, W. S. .....Thorp
Patterson, Chas. .....Franksville
Potter, Henry D. .....Baraboo
Potter, Geo. F. .....Madison
Pierce, N. P. .....Oshkosh
Phillipson, C. .....Oshkosh
Reek, Joseph .....Neenah
Rentschler, Geo. .....Madison

Reeve, Dr. J. S. ..... Appleton
Ramsey, Mrs. Robt. ..... Baraboo
Rosenow, Arthur ..... Oconomowoc
Ryan, Sam J. ..... Appleton
Reis, John ..... Ithaca
Reis, Albert ..... Ithaca
Rahr, Wm. ..... Manitowoc
Rounds, Mrs. S. A. ..... Eureka
Rogers, A. J., Jr. ..... Madison
Rockmann, N. M. ..... Barron
Rasmussen, N. A. ..... Oshkosh
Rhodes, Ed. ..... Hortonville
Rice, Wm. V. ..... Elmwood
Reinking, A. P. ..... Baraboo
Richmond, Susan ..... Madison
Richter, W. A. ..... N. Milwaukee
Ravn, L. H. ..... Barron
Rasmussenm, Fred ..... Barron
Rhodes, B. F. ..... Barron
Roach, Thos. ..... Fond du Lac
Rhodes, Thos. W. ..... Waukesha
Reichard, Ed. ..... Sturgeon Bay
Richards, M. W. ..... Madison
Rice, A. S. ..... Genoa Junction
Reupert, Walter ..... Milwaukee
Reinhardt, Walter ..... Milwaukee
Riordan, T. P. ..... Suring
Rouse, Mrs. Nelson ..... Oshkosh
Rundell, A. E. ..... Livingston
Rausher, Mrs. J. C. ..... Merrill
Smith, B. H. ..... Tiffany
Spry, John ..... Ft. Atkinson
Sandsten, Prof. E. P. ..... Madison
Sperbeck, M. V. ..... Oshkosh
Skewes, E. B. ..... Union Grove
Simonson, L. A. ..... Duluth, Minn.
Smith, Mrs. J. Q. ..... Madison
Schuck, John B. ..... Milwaukee
Sansum, David ..... Baraboo
Smith, S. L. ..... Oshkosh
Stead, Mrs. Jos. ..... Omro
Stevens, E. Ray ..... Madison
Smith, Howard ..... Poysippi
Schneider, A. ..... Marshfield

Stone, A. L. ..... Madison
(The) Shenandoah Nurseries ..... Shenandoah, Ia.
Schultz, J. L. ..... Lake Mills
Sorenson, P. J. ..... Somers
Steel, Lillie ..... Milwaukee
Shuckhart, H. ..... Bloom City
Shellenberger, C. F. ..... North Freedom
Sullivan, E. W. ..... Alma Center
Stone, A. ..... Barron
Swan, Chas. ..... Barron
Stirdivant, Geo. ..... Sheboygan Falls
Spoerl, Jos. ..... Antigo
Schnitzler, Jno. L. ..... Milwaukee
Siegel, Tony ..... Milwaukee
Smith, John Mills ..... Ashland
Spencer, L. E. ..... Wausau
Swan, P. G. ..... Sturgeon Bay
Simmons, Fred G. ..... Milwaukee
Stiehl, John D. ..... Sparta
Stephenson, H. S. ..... Sturgeon Bay
Sternberger, Chas. ..... Milwaukee
Stein, Geo. ..... Milwaukee
Smith, Rev. L. C. ..... Waukesha
Sheppard, Nelson ..... Oshkosh
Schanezer, Jos. P. ..... Wabeno
Smith, A. J. ..... Sawyer
Telfer, Joe ..... Ft. Atkinson
Ten Eyck, A. A. ..... Brodhead
Timms, C. J. ..... Ripon
Trettin, A. H. ..... Milwaukee
Tenney, H. A., Jr. ..... Madison
Torgersen, Theo. ..... Coon Valley
Tiefenthaler, G. E. ..... Milwaukee
Tulledge, Everett G. ..... Oakfield
Thurston, K. W. ..... Sparta
Tucker, W. O. ..... Union Grove
Timan, Mrs. Chas. ..... Eureka
Thatcher, O. M. ..... Weblake
Toole, E. H. ..... Baraboo
Thompson, W. E. ..... Somers
Trim, Geo. ..... Galesville
Toogood, V. R. ..... Lake Mills
Utter, Delbert ..... Lake Beulah
Umlauft, Rudolph ..... Dorchester

Unger, Ed. ..... Milwaukee
Ullsperger, H. W. ..... Algoma
Van Orden, J. ..... Baraboo
Williamson, W. D. ..... Madison
Wayne, Joseph ..... Boscobel
Williams, W. D. ..... Sparta
Wood, C. L. ..... Sparta
Wright, Geo. S. ..... Eau Claire
White, W. F. ..... Antigo
Wengler, M. B. ..... Milwaukee
Wilson, B. F. ..... Wausau
Welke, Sam ..... Fall Creek
Weber, Frank ..... Ft. Atkinson
Warner, Ernest ..... Madison
Walker, Geo. ..... Sawyer
Wegner, Wm. E. ..... Watertown
Wolla, Jno. H. ..... Cameron
Wright, Wallace ..... Antigo
Worman, M. A. ..... Chetek
Weigel, Emil ..... Milwaukee
Yahr, Solon ..... West Bend
Young, A. W. ..... Chippewa Falls
Zillmer, Wm. C. ..... Brookfield
Zabel, M. A. ..... Sharon

BARRON COUNTY LOCAL SOCIETY.

Barron, Wis.

Wm. Bartlett
W. L. Brown
F. H. Burdick
L. S. Cheney
C. T. Dillon
W. A. Dickenson (Almena)
J. Ducklow
E. J. Edwards
John Eades
N. S. Gordon
Fred W. Hoxie
Fred Kraenbuhl
Will McKee
E. McKinney
W. L. Morse
Chas. Oleson
E. O. Smith
Nelson Stebbins
Chris. Swartz
I. L. Van Sickle (Dallas)
Louis Voil
Fred Wickern

BAYFIELD PENINSULA HORTICULTURAL SOCIETY.

Bayfield, Wis.

Thos. Allen
Chauncey Andreas
Chas. G. Anderson
N. Bachand
Ed. Baldwin
Wm. Barningham
Currie G. Bell
Donald C. Bell
R. D. Bigelow (Ashland)
J. E. Bissell (La Pointe)
F. Boutin, Jr.
H. W. Boutin
S. L. Boutin
Chas. Boheme
B. J. Bracken
Fred Brauns
E. K. Brigham
Josuea R. Brown
Ben Carver
L. S. Carver
N. E. Carver
F. S. Cooley
Geo. Crawford
L. E. Davis
Peter DeBraie
W. W. Downs
Steve Drowns
Albert Eggler
D. K. Emmons
John Engbloom
Jos. Feldmier
P. F. Flake
O. Flanders
W. H. Fleck (Cornucopia)
John Frege
Ole Hadland
Jno. Hagberg
Nels Hagman
H. C. Hale
Herman E. Hanchett (La Pointe)
H. H. Hannum
J. F. Hauser
J. Kranzfelder
Glaspell LaBonte
F. N. Lang
W. Leniack (Cornucopia)
John Libby
Albert Lodle
Jas. Long
Chas. Lucia (Cornucopia)
C. J. McConnell (Superior)
G. A. McHenry
Paul Meitke
E. A. Miller
Einer Miller
Otis G. Mills
A. J. Mussell
A. Nelson
Hugo Nelson
Harvey Nourse
Laurie Nourse
C. A. Nye (Cornucopia)
D. W. O'Connell
J. P. O'Malley
Geo. A. Packard
A. J. Peterson
Jos. Peterson
G. A. Pine
E. E. Powell
W. S. Powell
Roy C. Rowley
F. J. Ruhlemama (Cornucopia)
A. B. Sayles
Herman Sense
Louis Shaparío
W. H. SinClair
H. V. Stahl
S. N. Strand
Frank Stark
Emil Swanson
J. H. Sykes
Jas. Theobald
A. M. Thompson
G. W. Thompson (Cornucopia)

Burt P. Hill
Otto Hofele (Cornucopia)
Frank Holston
Peter Howder
R. Inglis
F. Marion Jewell
C. E. Johnson
Cever Johnson
Jacob Johnson
M. Johnson
M. B. Johnson
J. A. Keith
R. S. Keith (Des Moines, Ia.)
Wm. Knight
Alex Koisky (Cornucopia)
Aug. Turnquist
L. M. Tyler
C. Vollenweider
O. J. Vorous
Henry Wachsmuth
H. J. Wachsmuth
John Walters
Sam Wasmuth
W. H. Weber
G. W. Weidman (Chicago)
Albert Wescott (Cornucopia)
Tom Whalen
T. F. Wieland
A. H. Wilkinson
Geo. Young (Cornucopia)

GAYS MILLS LOCAL.

Gays Mills, Wis.

F. T. Lowe
Mr. Lewis
J. W. McCullick
M. McGarigle
H. P. Mitchell (Mt. Sterling)
Mike Murphy
O. R. Pomeroy
H. R. Pomeroy
E. B. Purrington (Mt. Sterling)
Albert Rounds
C. J. Rounds
O. A. Sherwood
A. L. Stowell
Ed. Wallin (Bell Center)
Geo. T. Atwood
F. F. Bell (Readstown)
S. L. Brown
F. C. Brown
E. G. Briggs
Wm. Dupee
J. A. Hays
W. C. Hays
Chas. Johnson
P. K. Kinder
L. A. Lee
L. G. Lester
O. A. Lester

LAKE GENEVA GARDENER'S & FOREMAN'S ASS'N.,

Lake Geneva, Wis.

John Agern
Miles Barratt
C. H. Barry
Geo. Barlow
Fred Millar
Chris Madison
John Moier
Jas. Livingston

Frank Button
C. M. Cobb (Walworth)
H. M. Dickenson
Jacob Dale
Chas. Elliott (Williams Bay)
Martin Fahay
Henry Illenberger
Axel Johnson
Emil Johnson
Wm. Hurry
Jos. J. Krupa
Frank Kuehne
Herman Kutz
Hans Larson
Julius Kutz
Wm. Longland
W. H. Lawrence
Alber Meier (Madison)
Axel Nelson
Raymond Nills
Albert Ruepke
David H. Seal
Joe Sobbe
Ed. Sandgren
A. J. Smith
Geo. Shepard
Benj. Short
John Tiplady
Walter Tiplady
Geo. Trobridge (Beloit)
Wm. Towne
Wm. Wallstedt
Herman Yekes
C. Shilipp
Robt. Sampson

MADISON LOCAL SOCIETY.

Madison, Wis.

A. M. Anderson
Dr. F. F. Bowman
Preston W. Brown
E. R. Balsley
Miss M. V. Brown
F. K. Conover
A. B. Clayton
F. B. Drake
Dr. E. Everette
H. B. Gregg
Miss Jessie Goodenough (Tomah)
Ralph Goodenough (Tomah)
Miss Blanchard Harper
Mrs. Lucy Hiestand
David Isom
Miss Emma Ibenthaler
I. P. Ketchum
Prof. W. G. Kirchoffer
Robt. Lamp
Mrs. John Lueders
Miss Genevieve Mills
Mrs. W. A. P. Morris
O. S. Norsman
Perry Outhouse
Mrs. Oscar Olson
Michael Olbricht
Lewis Post
Mrs. L. F. Porter
G. W. Reigle
Browning Reigle
O. C. Road (So. Wayne)
O. L. Robinson
Ed. Sumner
Halle Steensland
Mrs. R. G. Thwaites
Thos. Turville
Henry Vasberg (Eagle)
Mrs. Geo. H. Wells
Mrs. A. O. Wright
Prof. F. W. Woll

MANITOWOC LOCAL SOCIETY.

Manitowoc, Wis.

J. C. Ahrens (Two Rivers)
J. S. Anderson
Geo. Barthels
E. S. Bedell
Anton Berge (Valders)
Harvey Bremer
Fred Christiansen
Otto Drews
John Ewen
Dr. L. Falge
Fred Freis
Henry Goedjen, Sr.
A. J. Griffin
F. C. Groelle
Chas. Hart
Louis Hartung (Two Rivers)
H. P. Hamilton (Two Rivers)
Herman Heydrich
H. F. Hubbard
F. A. Huebner
John Jarr
Willie Kahrs
Chas. Kornely
Jerome Ledvina (Cleveland)
Wm. Lonsdorf
Chas. Meistnest
J. P. Nachtvey (Kellnersville)
N. O. Nelson
J. E. Paulson
Eli Peltier
John Popp
Carl M. Schmitz
W. H. Spencer
Ole Stephenson (Cato)
E. E. Straka (Kellnersville)
J. Grant Tyler (Valders)
Jos. Voboril (Hika)
Miss Flora Waldo
Chas. Wigen (Quarry)
Otto Wiegand (Cleveland)
Hugo Wilkowsky (Mishicot)
Wm. Willsmann (Two Rivers)

OFFICERS AND COMMITTEES FOR 1909

President, Wm. Toole.....Baraboo
Vice-President, A. J. Smith.....Lake Geneva
Treasurer, L. G. Kellogg.....Ripon
Secretary, F. Cranefield.....Madison

EXECUTIVE COMMITTEE.

Wm. Toole, Chairman.....Ex-officio
A. J. Smith.....Ex-officio
L. G. Kellogg.....Ex-officio
F. Cranefield.....Ex-officio
1st Dist., Jas. Livingston.....Lake Geneva
2nd Dist., Prof. E. P. Sandsten.....Madison
3rd Dist., L. H. Palmer.....Baraboo
4th Dist., F. W. Harland.....Milwaukee
5th Dist., H. C. Melcher.....Oconomowoc
6th Dist., L. A. Carpenter.....Fond du Lac
7th Dist., W. H. Hanchett.....Sparta
8th Dist., Dr. T. E. Loope.....Eureka
9th Dist., D. E. Bingham.....Sturgeon Bay
10th Dist., Irving Smith.....Ashland
11th Dist., C. L. Richardson.....Chippewa Falls

FINANCE COMMITTEE.

Franklin Johnson, Chairman.....Baraboo
W. S. Hager.....West De Pere
W. P. Bussey.....Omro

COMMITTEE ON TRIAL ORCHARDS.

R. J. Coe, term expires.....1912
L. G. Kellogg, term expires.....1911
D. E. Bingham, term expires.....1910

LOCATION OF TRIAL ORCHARDS.

Wausau, Marathon county, 10 acres.....Established 1897
Medford, Taylor county, 3 acres.....Established 1903
Poplar, Douglas county, 7 acres.....Established 1904
Maple, Douglas county, 3 acres.....Established 1905
Barron, Barron county, 5 acres.....Established 1906
Manitowoc, Manitowoc county, 5 acres.....Established 1907
Gays Mills, Crawford county, 5 acres.....Established 1907
Sturgeon Bay, Door county, 5 acres.....Established 1908
Whitehall, Trempealeau county, 5 acres.....Established 1908
Lake Geneva, Walworth county, 5 acres.....Established 1908
Sparta, Monroe county, 1 acre (Grape station).....Established 1908

LISTS OF FRUITS RECOMMENDED FOR CULTURE IN WISCONSIN

The behavior of varieties of fruits is influenced very largely by environment. The conditions of soil, exposure and latitude over such an area as the state of Wisconsin vary greatly and no list can be given that will prove satisfactory in all localities. The following provisional lists were prepared by the Trial Orchard Committee. Hardiness of plant and fruit bud has been the leading thought in the selection of varieties.

APPLES (General List).

Alexander, Astrachan (Red), Autumn Strawberry, Dudley, Fall Orange. Fameuse (Snow), Golden Russett, Hibernal, Lowland Raspberry, Longfield, Lubsk Queen, McIntosh, Malinda, McMahan, Newell, Northwestern Greening, Oldenburg (Duchess), Patten Greening, Perry Russett, Plumb Cider, Scott, Tetofski, Talman (Sweet), Utter, Wealthy, Westfield (Seek-no-Further), Windsor, Wolf River, Yellow Transparent.

APPLES (Lake Shore List).

In addition to the above many other varieties including the following may me successfully grown in the extreme southern part of the state and in the counties bordering on Lake Michigan. **Baldwin, Eureka, Fallawater, Gano, King, Northern Spy, Pewaukee, Willow Twig, York Imperial, Bellflower.**

APPLES (Commercial Orchard List).

It is generally conceded that a commercial orchard should consist of but few varieties; the following are suggested: **Dudley, Fameuse, Longfield, McMahan, McIntosh, Northwestern Greening, Oldenburg, Scott, Utter, Wealthy, Yellow Transparent.**

APPLES (Five Varieties for Farm Orchard).

Northwestern Greening, Oldenburg (Duchess), Talman (Sweet), Wealthy. Yellow Transparent.

APPLES (For Trial).

These are all promising varieties but have not been extensively grown in any part of the state. **Gem City, Hanko, Lily, Wendorff, Zettle Bellflower.**

CRABS.

Brier Sweet, Hyslop, Lyman, Martha, Sweet Russett, Transcendent, Whitney.

PLUMS.

Of the classes commonly cultivated, viz.: **European, Japanese and Native or American,** the last named is the most reliable.

NATIVE PLUMS.

De Soto, Forest Garden, Hammer, Hawkeye, Ocheeda, Quaker, Rockford, Surprise, Wyant.

EUROPEAN PLUMS.

(Not recommended except along Lake Shore). **Lombard, Green Gage, Moore's Arctic.**

JAPANESE PLUMS.

(Not recommended except along Lake Shore). **Abundance, Burbank.**

CHERRIES.

Early Richmond. Montmorency.

GRAPES.

Brighton, Campbell's Early, Concord, Delaware, Diamond, Green Mountain, Moore's Early, Niagara, Worden.

BLACKBERRIES.

Briton (Ancient), Eldorado, Snyder.

STRAWBERRIES.

Varieties starred have imperfect flowers and must not be planted alone.

Bederwood, *Crescent, Clyde, Dunlap, Enhance, Gandy, Glen Mary, *Haverland, Lovett, *Sample, Splendid, *Warfield.

TWO VARIETIES STRAWBERRIES FOR FARM GARDEN.

Dunlap, *Warfield.

RASPBERRIES.

Black: **Conrath, Cumberland, Gregg, Older.**
Red: **Cuthbert, Loudon, Marlboro.**
Purple: **Columbian.**

CURRANTS.

Red: **Red Cross, Red Dutch, Long Bunch Holland, Victoria.**
White: **White Grape.**
Black: **Lee's Prolific, Naples.**

GOOSEBERRIES.

Downing.

PEARS.

On account of the prevalence of blight and winter killing, pears are not generally recommended for Wisconsin. Good crops are occasionally produced under favorable conditions, especially in the southeastern part of the state. The following list includes both early and late varieties.

Anjou, Bartlett, Clairgeau, Clapp Favorite, Early Bergamot, Flemish Beauty, Idaho, Kieffer, Laurence, Louise, Seckel, Sheldon, Vermont Beauty.

TREES AND SHRUBS RECOMMENDED

EVERGREENS.

For screens and windbreaks—Norway Spruce, White Spruce, White Pine, Austrian Pine, Scotch Pine.

For hedges and screens for shearing—Norway Spruce, American Arbor Vitae, Red Cedar.

For lawns—Norway Spruce for backgrounds. For groups—American Arbor Vitae, Red Cedar, White Spruce, Colorado Blue Spruce, Austrian Pine, Scotch Pine.

For small lawns—Arbor Vitae, Savin Juniper, Mugho Pine.

DECIDUOUS TREES.

The more desirable ones are starred, and a further selection of five is indicated by double stars.

**American Elm, Box Elder, Black Cherry, Carolina Poplar, **Green Ash, *Hackberry, Honey Locust, Larch, **Linden, **Norway Maple, *Scarlet Maple, **Silver Maple, *Sugar Maple, Scarlet Oak, *White Oak, White Ash.

DECIDUOUS ORNAMENTAL TREES.

This class includes smaller deciduous trees of more value for ornament than for shade or defense.

Crab (native), also Bechtel's double flowering crab, Cut-leaved Weeping Birch, Tartarian Maple, Ginnala Maple, Kentucky Coffee Tree, Mountain Ash, Weeping Willow, Russian Mulberry.

LIST OF SHRUBS RECOMMENDED.*

Scientific Name.	Common Name.
Berberis Thunbergii	Thunberg's Barberry
Berberis vulgaris	Common Barberry
Barberis vulgaris var. atropurpurea	Purple-leaved Barberry

* From Bulletin 108, Wisconsin Experiment Station, by F. Cranefield.

Corylus maxima var. purpurea.....Purple Filbert
Diervilla florida .....Weigela (rose)
Diervilla candida .....Weigela (white)
Diervilla hybrida .....Weigela (Eva Rathke)
Diervilla hybrida var. Desboisii.....Desbois Weigela
Eleagnus argenta .....Silver Berry
Euonymus Europaeus .....Strawberry Tree
Hibiscus Syriacus .....Althea
Hippophae rhamnoides .....Sea Buckthorn
Hydrangea paniculata gr.....Garden Hydrangea
Lonicera Ruprechtiana .....Ruprecht's Honeysuckle
Lonicera Tartarica .....Tartarian Honeysuckle
Morus Alba var.....Tea's Weeping Mulberry
Philadelphus coronarius .....Mock Orange
Philadelphus coranarius var. aurea.....Golden Mock Orange
Philadelphus inodorus.....Mock Orange, large fl.
Pontentilla fruticosa .....Shrubby Clinque Foil
Prunus nana .....Russian Almond
Rhodotypos kerrioides .....Rhodotypos
Rhus Cotinus .....Smoke Bush
Ribes aureum .....Missouri Flowering Currant
Robinia hispida .....Rose Acacia
Rosa rugosa .....Japanese Rose
Sambucus nigra var. aurea.....Golden Elder
Shepherdia argentea .....Buffalo Berry
Spiraea Bumalda .....Bumalda Spiraea
Spiraea Bumalda var. .....Anthony Waterer Spiraea
Spiraea Billardii .....Billard's Spiraea
Spiraea Douglassi .....Douglas' Spiraea
Spiraea Japonica .....Japanese Spiraea
Spiraea salicifolia .....Meadow Sweet Spiraea
Spiraea Van Houtte .....Van Houten's Spiraea
Syringa Persica .....Persian Lilac
Syringa villosa .....Chinese Lilac
Syringa vulgaris .....Common Lilac
Tamarix Pallassii Desv. (Tamarix Amurense Hort.)...Amur. Tamarix
Viburnum Opulus vr. sterile.....Snowball

ROSES.

Hardy garden—Harrison Yellow, Persian Yellow, Madame Plantier.

Twelve varieties hybrid perpetual—Paul Neyron, Mrs. J. H. Laing, Gen. Jacqueminot, Dinsmore, Marshall P. Wilder, Coquettes des

Blanches, Earl of Dufferin, Jules de Margottin, Vick's Caprice, Magna Charta, Prince Camille de Rohan, General Washington.

Moss roses—Perpetual White, Salet, Paul Fontine, Henry Martin.

Climbers—Prairie Queen, Russel's Cottage, Seven Sisters, Gem of the Prairies, Crimson Rambler.

Five hybrid perpetual roses for the garden: Gen. Jacqueminot. Magna Charta, Margaret Dixon, Mrs. John Laing, Paul Neyron.

COMPARATIVE HEIGHT AT MATURITY OF DIFFERENT SHRUBS.

The height at maturity of the different species must be considered when planting in groups or borders. This will depend so much upon their environment that it is difficult to give the height in feet that any species may be expected to attain. When different kinds are planted under like conditions it may be assumed that relative heights will be maintained. The following may serve as a partial guide in planting:

Tall—10 to 15 Feet.

Barberry (Common)
Lilac, Common
Lilac, Japanese
Golden Elder
Lilac Jossika's
Honeysuckle, Fly
Mock Orange
Honeysuckle, Slender
Sea Buckthorn
Honeysuckle, Tartarian
Siberian pea tree (tall)
Honeysuckle, Tartarian white

Medium—6 to 10 Feet.

Barberry, purple
Crandall Currant
Silver Berry
Honeysuckle, Blue
Strawberry Tree
Japanese Rose
Spiraea, Billard's
Lilac, Chinese
Spiraea, Douglas
Purple Filbert
Spiraea, Three-lobed

Rose Acacia
Spiraea, Van Houten's
Russian Almond
Weeping Mulberry
Siberian Pea tree (dwarf)
Wiegelas

Dwarf—2 to 6 Feet.

Althea
Spiraea, Anthony Waterer
Barberry, Thunberg's
Spiraea, Ash-leaved (Sorbaria)
Cinque Foil
Spiraea, Bumalda
Honeysuckle, Albert's
Spiraea, Japanese
Hydrangea
Spiraea, Meadow Sweet
Rhodotypos
Spiraea, Plum-leaved

A LIST OF NATIVE SHRUBS DESIRABLE FOR PLANTING ON HOME GROUNDS.

Scientific Name.	Common Name.
Arctostaphylos Uva-ursi	Bearberry
Ceanothus Americanus	New Jersey Tea
Cephalanthus occidentalis	Button Bush
Cimaphila umbellata	Prince's Pine
Comptonia asplenifiora	Round-leaved Dogwood
Cornus stolinifera	Red Osier Dogwood
Dirca palustris	Leatherwood (Wickopy)
Epigaea repens	Trailing Arbutus
Euonymus atropurpureus	Wahoo
Hypericum pyramidatum	St. John's Wort
Ilex verticillata	Winterberry (Holly)
Juniperus procumbens	Trailing Juniper
Myrica Gale	Sweet Gale
Physocarpos opulifolia	Ninebark
Rhamnus catharticus	Buckthorn
Rhus Typhina	Staghorn Sumac
Rhus Glabra	Smooth Sumac
Rhus copallina	Dwarf Sumac
Ribes rubrum	Wild Rose Currant

Ribes floridum ..... Wild Black Currant
Rosa lucida ..... Wild Rose (tall)
Rosa blanda ..... Wild Rose (dwarf)
Rubus odoratus ..... Purple-flowered Raspberry
Rubus Nutkanus ..... White-flowered Raspberry
Sambucus Canadensis ..... Common Elder
Sambucus pubens ..... Scarlet Elder
Shepherdia Canadensis ..... Shepherdia
Symphoricarpus racemosus ..... Snowberry
Symphoricarpus vulgaris ..... Coral Berry
Taxus baccata ..... Ground Hemlock
Viburnum lentago ..... Sheepberry
Viburnum dentatum ..... Black Haw
Viburnum acerifolium .....
Viburnum opulus ..... Bush Cranberry
Zantoxylum Americanum ..... Prickly Ash

SIX SHRUBS FOR HOME GROUNDS.

The following are all reliably hardy in any part of the State:

Common Lilac, Tartarian Honeysuckle, Rosa Rugosa, Mock Orange or Syringa, Van Houten's Spiraea, Common Barberry.

THREE HARDY PERENNIAL VINES.

Ampelopsis or American Ivy (native in southern Wisconsin). Wild Grape, Trumpet Honeysuckle.

BLACK LIST

A LIST OF SHRUBS ALL OF WHICH HAVE BEEN TESTED ON THE GROUNDS OF THE EXPERIMENT STATION AT MADISON AND FOUND UNSATISFACTORY.

Scientific Name.	Common Name.
Azalea arborescens	Rhododendron
Azalea viscosa	Rhododendron
Azalea nudiflora	Azalea
Azalea mollis	Azalea
Calycanthus floridus	Sweet-scented shrub
Caryopteris Mastacanthus	Blue Spiraea
Chionanthus Virginica	White Fringe
Clethra alnifolia	Sweet Pepperbush
Colutea arborescens	Bladder Senna
Cornus florida	Flowering Dogwood
Cydonia Japonica	Japanese Quince
Daphne Cneorum	Daphne
Daphne Mezereum	Daphne
Deutzia gracilis	Slender Deutzia
Eleagnus longipes	Goumi
Exochorda grandiflora	Pearl Bush
Forsythia suspensa	Golden Bell
Halesia tetraptera	Snowdrop tree
Itea Virginica	Virginia Willow
Kerria Japonica	Kerria
Ligustrum vulgare	Common privet
Paulownia imperialis	Paulownia
Prunus cerasifera var. (Prunus pissardi Hort)	Purple-leaved Plum
Prunus Japonica	Flowering Almond
Prunus triloba	Flowering plum (double)
Spiraea Arguta	Arguta Spiraea
Spiraea Thunbergii	Thunberg's Spiraea

The plants of certain of the above named varieties made a good growth each year but have not blossomed unless given thorough winter

protection. In this class are Bladder Senna, Flowering Almond, Flowering Plum and Golden Bell.

The Japanese Quince is hardy of bush but has not borne flowers except when given winter protection. The Goumi will only bear fruit when protected in winter. The double-flowered Almond will blossom freely if given thorough winter protection, otherwise it will kill back severely. The double-flowered Plum grows well and after a mild winter will bear flowers in advance of the leaves; unreliable, however, four years out of five if unprotected.

The others of this list have either died outright or else barely survived.

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

SUMMER MEETING.

STURGEON BAY, WIS., AUGUST 26, 1908.

MORNING SESSION.

The meeting was called to order by the President, Mr. R. J. Coe, at 11 o'clock.

After the invocation by Rev. Sam. Groenfeldt, the President introduced Mr. Henry Graas, of Sturgeon Bay, who delivered an address of welcome.

ADDRESS OF WELCOME.

MR. HENRY GRAAS, of Sturgeon Bay.

"Who comes to Para is glad to stay,
Who drinks Assai goes never away."

So sang a celebrated guest of that famous South American, Brazilian seaport city.

And what is true of Para is true of Sturgeon Bay. I have yet to hear of a visitor who sojourns with us for any length of time; who roams our fields and forests, sails, bathes and fishes in our waters and breathes the pure air and basks in our bright sunshine; while, if they do not stay, they come back to us year after year for their rest, pleasure and recreation. And I trust many of our visitors will imbibe very freely in these gifts of nature and long to be one of us.

To the Agriculturist and Horticulturist this is indeed God's chosen country. While gardening and the raising of small fruits and flowering plants are still in their infancy in this county, I am sure you visitors with us today will agree with me, as you visit our gardens and orchards, that a bright future awaits this county in this respect.

Situated as we are, between two bodies of water, they temper the sun's rays, give us heat in the cool night, furnish moisture as refreshing as summer showers and protect us from sudden frosts, all of which goes to make a climate suitable for your line of pursuit.

In behalf of the citizens of this city and county, I extend a hearty welcome to our worthy visitors; a welcome to a city whose cleanliness is marked at once by every stranger; whose modern buildings bring forth words of praise, and we are proud of them, because most of them are built of Door county stone.

We welcome you to a city where hard times are never felt. While other cities are now complaining of financial and business stringency and hard times, with an army of unemployed, here there is being erected a $20,000 electric light plant, a $50,000 schoolhouse, a $20,000 sheriff's residence and jail.

We welcome you to a city whose quarries are the best in the state, and as extensive as any, and are working night and day to fulfill contracts. While we have no gigantic factories of which we can boast, we have that which is far better—a rich agricultural district about us. Factories burn, shut down and have strikes and lockouts, but our farms and farmers give us a stability that no commercial enterprise can give us.

I congratulate you on the work in which you are engaged; it must be a pleasurable vocation. It is due to your Society that Door County today occupies the position that it does in horticulture, for we have with us one of the foremost of your Society,

Mr. Hatch, and if I were to tell you what he has done for Door County, it would take me an hour, but suffice it to say that we are glad to have him.

I am sure that many of our people who are agriculturally and horticulturally inclined will receive vast benefit from your session, and may the great State of Wisconsin and all her people aid you in this magnificent work in which you are engaged.

RESPONSE.

President R. J. Coe.

Personally, it has long been my desire to visit the Sturgeon Bay country. I have heard of it ever since Mr. Hatch first came here. I have heard of it from others besides Mr. Hatch, and I am sure that every member of the State Horticultural Society has had that same desire, and now we are here with you today and a part of tomorrow, and I assure you, Mr. Speaker, that we accept your very hearty welcome and I am sure we will enjoy ourselves, and we will try to leave Sturgeon Bay feeling that the State Horticultural Society is of some value to the State; that the State Horticultural Society does carry an influence with it wherever it is known and wherever we go. With these few words I again thank you for the very cordial and hearty welcome you have given us.

We will now proceed with the regular morning's program, which is given up mainly to flowers, as you will see.

ANNUAL AND BIENNIAL FLOWERING PLANTS; THEIR VALUE IN GARDENING AND HOME DECORATION.

ROBERT SAMPSON, Delegate Lake Geneva Society.

Mr. President, Ladies and Gentlemen: The subject of my paper is "Three favorite flowers, asters, sweet peas and pansies."

ASTER CHINA *(Callistephus Chinensis)*.

This favorite annual is a native of China. It was first introduced into Europe about 1731 by R. P. D'Incarville, a Jesuit Missionary in China. At that time, it was a single flower.

Phillip Miller, the famous gardener and botanist of Chelsea, England, received seed of the single white and red in 1731, evidently from France, single blue in 1736. In 1752, he obtained seeds of the double red and blue, and in 1753, of the double white.

The species were well known to American gardeners at the opening of the 19th Century.

The first great evolution in Asters was made in Germany, where a good deal of the seed comes from.

The present range of color, and types in China Asters, is large and to classify them all is quite a task, but the following types are good for all practical purposes—

Comet, Ostrich Plume, Paeony Flowered, Quilled, Chrysanthemum Flowered, Crown, Hohenzollern, Victoria, Branching, Washington and Queen of the Market. By growing this list you can have a succession of bloom from June until frost.

All colors can be had in these varieties except a good yellow, which I have not seen up to the present writing.

The seed of early varieties should be sown under glass in one form or other in March or April. Seedlings should be transplanted two inches apart each way, in shallow boxes. Plant out of doors as soon as soil and weather permits; seed should also be sown out of doors and then transplanted.

Asters will grow on almost any soil, but for best results, the

ground should be well manured and dug deep. They should be kept well hoed through the growing season and kept free from all weeds.

SWEET PEAS, *(Lathyrus Odoratus)*.

The sweet pea has been traced back to 1650. The origin of the sweet pea is divided principally between Sicily and Ceylon, the original purple variety being native to the former Island and Sardinia. Sicily was also the native habitat of the white variety. Testimony also points to Ceylon as the home of the original pink and white variety, known as the Painted Lady; the original red also came from Ceylon.

Father Franciscus Cupani, an Italian monk and botanist, is credited with being the first cultivator of this flower at Panormus in Sicily, in 1699 and the seed of the purple variety was sent by him to England and elsewhere.

The seed of sweet pea became an article of commerce as early as 1730. In 1793, a London seed catalogue listed four varieties, Black, Purple, White and Painted Lady. About 1876, Henry Eckford of Shropshire, England, took up the sweet pea. He began with six or seven common sorts and up to 1898, put out about 75 varieties. Then his work of 22 years began to be appreciated, and a number of other good workers came into the field.

J. C. Schmidt of Germany, and Laxton of England did good work in originating new varieties.

When it was found that they could raise good sweet pea seed in California, it brought this State as the producer of sweet pea seed for the whole world. Think of a single field with four hundred acres of sweet peas in bloom at one time. In 1893, the first dwarf sweet pea was found in California, color white. Now it comes in all colors. A good many of strong American varieties have come out, also the Spencer type of Orchid flowering.

I will name a few of the varieties that do well with us in this locality.

For White—White Wonder, Dorothy Eckford, Nora Unwin.

For Pink—Countess Spencer, Gladys Unwin, Mrs. Alfred Watkins, Royal Rose.

For Lavender—Dorothy Tennant, Lady Grisel Hamilton.
For Yellow—Hon. Mrs. E. Kenyon.
For Scarlet—King Edward VII.
For Crimson—Salopian.
For Blue—Navy Blue, Countess of Cadogan.
For Purple—Duke of Westminster.
Pink and White—Blanch Ferry (extra early).
Pink and White, (Earliest of all).
Rich Orange Salmon, Evelyn Byatt.

Cultivation: The sweet pea likes a rich, rather heavy soil to get the best results—for early peas the ground should be prepared in the Fall, the soil should be dug up deep, and good rotten manure spaded in. This should be put on as heavy as possible, so that it is under the ground, as early in the Spring as possible. Open up a trench about 3 inches deep, sow the seed, and then cover up with soil which has been kept under cover for that purpose, one inch deep. Then in the month of June, fill up trench; all sweet peas will do better if they are brushed, than if you use wire for a trellis. Late sowings are never as satisfactory as early sowings—the first part of April being late enough.

PANSIES, *(Viola Tricolor)*.

Pansy: The old name Heartsease, which means Remembrance.

Parkinson first speaks of the pansy in 1629. The pansy is generally considered to have originated from Viola Tricolor, a small perrenial violet native to the cooler parts of Europe. Gerard gives a description of pansies in 1587, Heartsease or Viola tricolor.

Pansies were first improved from the original type in Great Britain, and new varieties were gradually brought out with larger flowers and varied colors.

England and Scotland held the honors for good pansies until about 1778, when three French Specialists, Bugnot of St. Brieuc, Cassier and Trimardeau of Paris made immense strides in developing the pansy. Trimardeau created a new race with immense flowers and a very hardy constitution. His strain crossed with Cassier and Bugnot easily superseded the English strains.

The Pansy, though a perennial, is generally treated in this country as an annual.

For early spring flowering, the seed is generally sown in the latter part of July, and transplanted about 8 inches to one foot apart to the place where they are to flower, the following spring, and protected through the winter with a covering of leaves, coarse manure or slough hay.

Pansies do best in a clayey soil well enriched with rotten manure—frequent sprinklings to keep the ground and foliage moist will be of great benefit to them.

For summer flowering, pansies can be sown any time from February until June and will give a succession of bloom until frost.

As to varieties, they are very numerous as to size and color. It is best to get pansy seed from some one who makes a specialty of growing same, as it needs a good deal of judgment and work to keep the strains up to the standard.

DISCUSSION.

Mrs. Barnes: I would like to know the cause of and the remedy for Branching Asters blighting. (Showing a blighted plant.)

Mr. Sampson: It is a hard question to answer. I think it comes from the condition of the soil that it is planted in, the soil not being rich enough.

Mrs. Barnes: The soil that that grew on is very rich.

Mr. Sampson: I could not give you a satisfactory answer to that. I have some like that, but there are so many causes, that I really could not give you one.

The President: Is there anyone here that can give a cause for this. It seems to be a blight.

Mrs. Howlett: A great many of our flowers are in that condition. In the early part of the season it was very wet and in the latter part of the season it has been very dry, and I lay it to the state of the weather that caused the asters to blight, as they have a very poor root growth, and even the weeds have a poor root growth. They did not take hold of the soil; one can pull

the plants and weeds out easily. When it was so very wet the plants did not make a good growth in the early part of the season, in the latter part of the season it was so dry that many dried up unless one carried water, and even carrying water does not do much good when there is such a stunted growth.

Mr. Sampson: Asters will not do well two or three years in succession on the same ground. We have found that very often to be the case.

Mr. Longland: It may come from watering the surface of the soil.

Mr. Tiplady: It has been my observation in connection with asters that the Comets are most susceptible to that disease. At present at Lake Geneva an entire patch of Comets was entirely eaten up with that fungous disease, I believe it is, whereas the Victorias were not affected. Of couse that is a weakness there, and I believe it is as Mrs. Howlett says, that that extreme moisture in the spring would naturally cause a weak development of the root, and when the hot weather came, it would leave the plant in a condition to be attacked by the fungus, which is very common in asters.

Mrs. Howlett: This variety is the Violet King, and I find I have as many of the Branching varieties as I have of the Comet that are in this condition.

The President: We will take up the discussion on Sweet Peas. Any question or remarks on this branch of the subject?

Mrs. Barnes: I would like to ask why Sweet Peas get yellow half way up the vine?

Mr. Sampson: That is a fungous disease, and very often late plantings will have that more than the early plantings.

Mr. Toole: I would like to ask what can be done against the aphis on Sweet Peas.

Mr. Sampson: The best remedy I have found is a compound called "Excel All;" it is a mixture made from nicotine, spraying Sweet Peas with that will kill every aphis that there is on them. I have sprayed mine twice. Just one spraying will fix the aphis. That is the best stuff I have ever found.

A Member: Is there a preparation of nicotine and oil?

Mr. Sampson: I do not know if there is any oil in it; it is an English preparation.

Mrs. Barnes: Is there any remedy for this fungus?

Russian Olive.

The soft drab or gray of the Russian olive adds a touch of beauty to any landscape.

Clematis recta.

A dwarf, free-blooming clematis. **Herbaceous in character.**

Mr. Sampson: Yes, the Bordeaux mixture is good for fungus, even on Sweet Peas, if they are sprayed soon enough.

Mrs. Barnes: Do you ever spray them before you see it appear?

Mr. Sampson: Yes, very often; the spraying has come to be of just as much importance as planting; you must spray to keep these diseases away.

Mrs. Barnes: How about the Aster? Do you think spraying with Bordeaux mixture would help the Aster?

Mr. Sampson: Well, I would not know what to say; I would have to leave it to some one better posted than myself. We had a meeting of scientific men and one man told us he had lost four thousand and we could not get at any direct cause, but this man thought it was caused by his land not being rich enough. They were planted in a border where he had them for several years. Then he had several thousand in his vegetable garden and he said they were all right. He therefore thought it was caused by his land being poor.

Mrs. Barnes: How long can you raise pansies in the same bed without changing and have them good?

Mr. Sampson: I think if the bed is prepared well in the fall, you can grow them a number of years.

Mr. Long: I would like to know how we can get pansies to bloom for Decoration Day?

Mr. Tiplady: Pansy seed sown in July, protected over winter, will be in fine shape for Decoration Day.

The President: Mr. Sampson endorses that.

Mr. Hatch: May I illuminate this subject with another thought that came within my experience. I love pansies; I love them because they come so early in the season, love them for their intrinsic beauty. I had failed for several years to winter the plants over; I did just as the last speaker said, but I failed utterly. Last winter I placed some stakes that I had in my wood-hauling rack along my pansies and put slats across them; that supported my litter and did not smash the life out of the pansies, and I succeeded very well. Another thing you can do with pansies that I have not heard mentioned; you can stimulate them with land plaster, common gypsum; it will stimulate them just as it will a clover plant. If you have never used it on pansies you will be delighted; a little dusting will give wonderful results.

Mrs. Barnes: I would like to ask when you dust the pansies?

Mr. Hatch: Whenever you have anything to grow or encourage, feed with it.

Mrs. Barnes: After the pansies are in blossom, would you use gypsum?

Mr. Hatch: No, no, if you are going to keep your pansies in bloom, you must cut them before they go to seed, and there is this about the pansy, the more you cut, the better your plants will thrive, and anybody that is stingy with flowers will not have any flowers; so cut them off freely and do not allow them to go to seed. As far as land plaster is concerned, just as soon as you have a plant started, encourage it. I have never found in cultivating a plant any time that is so valuable or critical or useful as to encourage it when it is small. You want to take your baby plants and nurse them, as you do chickens, then is the time to do it.

OLD TIME FAVORITES SUCH AS BALSAM, HOLLYHOCKS, ETC.

MR. WILLIAM TOOLE.

Old times were the days of long ago when grand-parents of the present day were young, and before. We had beautiful flowers in those days, fifty or sixty years ago, and we loved them for their beauty and individuality.

Something was done in the way of carpet bedding and massing for color effect, but we loved variety in our gardens; and, the lawns not being so much in evidence in the foreground as since the introduction of the lawn-mower, we had our flowers in front of the house on each side of the walk, with an overflow supply in the vegetable garden and the back yard. When evening shadows gathered around us or when dew-drops sparkled in the morning sunlight, we had fragrance of flowers such as we seldom enjoy in these days.

We would not do without our lawns, and are ready to concede that it is not in good taste to cut them up with many flower beds, but there has been a time in later years when we missed the old time favorites, because there seemed to be no place for them.

The back yard is giving a home to our old time favorites, for which blessed be the names of those who are spreading the gospel of back yard improvment. Again as of old we may have warted to us on the evening breeze the fragrance of Mignonette, Sweet-rocket, Pinks, and Gilliflower. Again, if we wish, we may have a bouquet such as was given to your grandmother when she was a girl.

The beauty of bouquets in those days was often valued by the number of varieties of flowers grouped together, and it required good judgment and taste to arrange the various colors in harmony. Then as now there were some odd expressions of fashion and taste in floral arrangement. Well do I remember a lady visitor at our school when I was a boy in the city of Providence, Rhode Island, who carried a bouquet of Dahlias backed with a green flat surface of Arbor Vitae. At a later date the fashionable bouquet was round or pyramidal in form, with a surfacing of flowers as smooth as a football,—each flower having been stemmed with a bit of broom-straw and all sustained with a supporting of moss around a central handle. Now-a-days in fashionable arrangements bouquets and plants are often dressed out and overloaded with ribbons.

Yes we had beautiful flowers in those days,—the best the world had to offer, and if much has been added to this store we of the old days could not miss what we did not know of. To list and describe all the varieties which we then grew in our gardens would make a paper all too long, so I will only mention some of the common favorite kinds: Catchfly, Bouncing Bet, Bee Larkspur and other Delphiniums including the annual varieties, Bachelor's-buttons, Monkshood, Blackberry Lily, Sword Lily, Mourning-bride, Morning-glory, Sweet-rocket, Satin-flower, Sweet Mignonette, Sweet William, Love-lies-bleeding, Joseph's coat, Princess-feather, Cockscomb, Devil-in-a-bush or Love-in-a-mist, Four-o'clock, Youth and Old Age, Sun Dial, Venus' paint brush, Pot Marigold and other Marigolds, Balsam or Touch-me-not, Verbenas, Petunias, Hollyhocks, and many others.

Very interesting were the little Johnny-Jump-Ups, or None-so-pretty as they were called in my old New England home. We loved to study the faces which fancy discovered in the flowers. There were but few of the improved pansy within my knowledge sixty years ago, and they did not compare with the present day pansies in size and variety; but that time was only about thirty-

five years later than when the English growers first began to improve the Viola tricolor. There have been wonderful changes in others of our old time flowers, as: Youth and Old Age or Zinnia, Petunia, Dahlia, Sword Lily or. Gladiolus, Geraniums, Hollyhocks, Sweet Peas, China Pinks and others.

Our program calls for methods of culture and mention of best varieties of some of the old time favorites such as Balsam, Hollyhock, Snapdragon, Verbena, and others.

Having the garden in which to grow our flowers, we must have the plants, which may be raised from seed or bought from the florist ready for planting-out. The best method of starting seeds depends upon various circumstances; the larger seeds like Four-o'clock, Balsam, Morning-glory, Helianthus, etc., may generally be safely planted in the open ground with ordinary weather. In early spring we usually have weather sufficiently moist to make it safe to sow seeds of Larkspur, Aster, Poppies, Pansies, the different Dianthus, and in fact any of the kinds which incline to come up with self-sowing, do best with early planting. Poppies do not transplant well and by all means should be planted early in spring or late in the fall where they are to stay, thinning out instead of transplanting. Some things like Cockscomb, the Amaranthus in variety, Portulaca, Balsam, and others are warm weather plants and do not thrive with early planting. Too often the weather is not as we wish, and choice flower seeds are expensive, so to insure success it is necessary to have a special seed bed in which to start and nurse the young plants until they are large enough to be transplanted to the garden. The soil of the seed bed should be rich, mellow, and free from weed seeds. Good drainage is necessary, and the bed should be enclosed with sides and ends to support cloth covered frames which are needed to keep the surface moist when the soil exposed to wind and sunshine would bake hard and prevent seeds coming up. We stir the soil of our seed beeds with a pronged hoe, then rake smooth and tramp firmly. This process is repeated and then the surface is made very smooth and even, ready for the seeds. A thin coating of wood's earth is desirable as it keeps the surface mellow and less liable to pack hard.

As it is very important that fine seeds shall not be covered too deeply, the rule of covering to only twice the diameter of the seeds is a good one. The seeds should be sown in rows, of course, and a board is needed to stand on and to serve as a

straight edge. Varieties which germinate in about the same length of time should be sown near each other; because after plants come up they need airing and exposure to full sunshine, so if we must give extended shading to some kinds it is well to have them together. All of the cruciferae, like stocks, come up quickly after sowing, as do also Asters, most of the Dianthi, and many others.

Sometimes it is desirable to transplant into another nursery bed before putting the plants in the garden. It is very necessary to shift plants from the seed bed before thy become drawn and slender. If too much crowded when young they never give as good satisfaction as when grown stout and bushy. The protection which plants receive in such a bed brings them along much faster than in the open ground, so it is important not to try to start tender things too early. If Poppies, Mignonette, and other things which are impatient of transplanting, are started in the open ground they may be assisted in a dry time by covering with paper. It is well to sow very small seeds, like those of Petunias and Portulacas, in small boxes, that special care may be given them if needed.

In the meantime the garden should be prepared for the plants, that the soil may be moist even though dusty on the surface.

Plants of a kind should be massed together rather than indiscriminately mixed. Some thought should be given to the relative height of plants when planning the garden. If there is no room elsewhere, make room for them in the kitchen garden.

Be generous in giving away the flowers and you will have more, as this will prevent seeding which checks the growth of the plants. Most flowering plants do best in a rich soil and all are better if the soil is kept cultivated around them.

Balsams have not been changed much by plant-breeders in many years. The two classes of rose and camelia flowered include a great variety of shades and markings. Where there is an abundance the stems may be cut for vases, and the flowers can be used in designs. They are easily grown between the time of spring and autumn frosts. The Snap-dragon, of late years, has been taken up as a florists flower and is now grown in the greenhouses for winter blooming. For the garden we have the three classes, dwarf, half-dwarf, and tall, and many shades and combinations of red, yellow, purple, and white. For cut-flowers the tall are the most desirable. Although the seeds are small they

germinate readily and are easily transplanted. Very rich soil is not necessary for them, but they should have cultivation. They are quite hardy and may be started early, while if not permitted to bear seed they keep up a succession of blossoms until the hard frosts of autumn. Some times the plants live over winter. Verbenas are very desirable for masses of color and are useful in bedding or to border large beds of other plants. The seeds are slow to germinate, and it is desirable to have the plants started early to prolong the flowering season. The flowers drop too readily to be of use as cut flowers. Many of them are very pleasantly fragrant. There has not been much change in varieties of Verbenas for many years. Those with white centers are generally preferred. The so-called giant class is somewhat stronger in growth than the others. Verbenas are now more generally propagated from seeds than from cuttings.

Hollyhocks, like Sweet Williams, Sweet Rocket, and some other plants that are classified as perennials, do best if treated as biennials, sowing seeds each year for the next year's blooming. They are to be had in a great variety of shades in white, pink, crimson, salmon, dark purple, and almost black. They are divided into several different classes or strains. Of the smooth edged full double class, perhaps Chater's, an English strain, is as good as any. An American class, the Allegheny, has large fringed flowers and is a general favorite. A new class of Hollyhocks which bloom the first year from seeds, and can be treated as annuals, has been introduced by a German grower, but I have had no experience with them. The singles also make a fine showing. The Hollyhock is a showy, stately plant and appears to good advantage with a background such as a building, tall fence, vine draped trellis, shrubbery, or evergreens. The seeds need not be planted early,—June is soon enough,—as it is for most perennials and biennials. It is well to start them in a nursery bed and in September, plant where they are to stay. To winter over they must have good drainage, for if wetness surrounds them and ice covers them in winter and spring the crowns will decay. For protection the covering should be light, for if heavy, dampness holds and decay follows. This rule holds with all plants which do not shed their leaves, such as Sweet William, and other pinks, For-get-me-not, etc. Plants which lose all of their leaves and start from dormant buds near the roots; like Peonias, Phloxes, Delphiniums, Aqulilegias, and the like, will bear such heavy cov-

ering as coarse manure. Sometimes we may have a Hollyhock of such rare shade or other desirable quality that the owner may desire to continue its growth. With careful nursing young plants may be started from side shoots, and if the stalks are cut down as soon as they have done flowering, and before ripening seeds, there is a good chance that old plants will winter over, but it is less trouble to raise young plants from seed.

DISCUSSION.

Mr. Tiplady: That paper is so descriptive that questions are hardly necessary.

The President: Mr. Toole has covered the ground thorougly.

Mrs. Barnes: I would like to ask if there is a perennial Snapdragon?

Mr. Toole: The Snapdragon is naturally perennial. Of course, there are many things we grow as annuals; Snapdragon, Pansies and others, and, as I mentioned in that paper, the Snapdragon occasionally winters very well—not often, but perhaps four or five times in twenty years.

Mrs. Barnes: Then you would not classify it as a perennial?

Mr. Toole: No, we classify it as an annual.

Mrs. Howlett: I think Henderson and Vick both classify the Snapdragon as a perennial. I have kept it frequently without any protection; they will winter easily without any care.

CAMPANULAS, FOXGLOVES, AND OTHER BIENNIALS; CLASSIFICATION AND CULTURE.

HENRY W. ILLENBERGER, Del. Lake Geneva Gardener's & Foremen's Assn.

It is my pleasure to talk to you this morning on Campanulas, or (Canterbury Bells), Foxgloves, and other biennials.

Commencing with the Campanulas, or (Canterbury Bells) it may be said that there are only a few biennial varieties and that is Campanula, Calycanthena and its types being rose, blue,

striped, white in single and also the same types in double flowering varieties. These types which I have mentioned belong to the Bell flower family (Campanulaceae).

These mentioned varieties of the Campanula family should be sown during the first part of July, in a mixture of one-third clay, one-third leaf mould, and one-third sand. The planted seed should be kept covered for a few days with a wet burlap until it has germinated. It is then advisable to keep the young seedlings shaded on hot sunny days, until they develop two leaves. It is also advisable not to disturb the young plants 'till the middle of August, for by that time you should have beds for the biennials ready for renewing the same. It is the best time to transplant these young plants in the place where you intend to have them bloom.

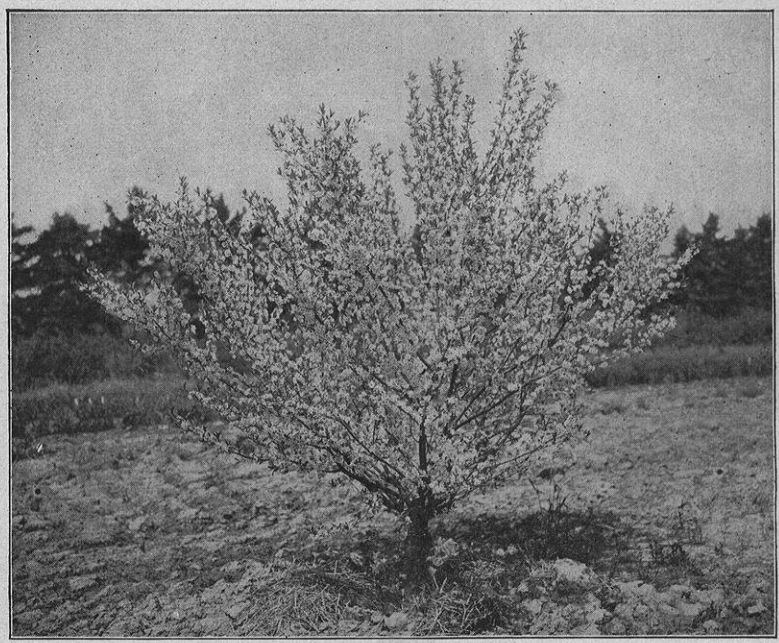
The location for the campanula beds should be selected on the side partially protected from the north-east, with protection through the winter and early spring from moisture. As soon as the frost is about one-half inch in the ground, it will be necessary to cover the beds, if possible, with spruce branches, and leave them protected by these branches until the frost leaves the ground in the Spring. I would advise the gradual removal of the covering so as not to take the risk of a too sudden change for the plants. It is advisable, until they show new life in spring, to give them a good mixture of natural fertilizer. My experience with the Campanula variety has shown me, that by following this treatment, I have derived full satisfaction.

The next variety of the biennials, of which I am to speak, is Digitalis Purpurea or (Foxgloves) belonging to the Scrophulariaceae, or (Figwort) family, very commonly known as old fashioned plants. This variety is of European origin, but having sparingly escaped from cultivation, it may also be found in a wild state.

The culture of this variety may be said to be easier than the biennial previously discussed. Sown early in July, in sandy loam in open ground partly shaded, transplanting after six weeks to the selected ground for blooming. The location should be on an open hillside, with not too rich a soil. In this climate, foxgloves require a light winter protection consisting of a thin covering of slough hay or cat-tail reeds. It is very advisable to keep a protection against a heavy moisture. Therefore a hill-

Thunberg's barberry, berberis Thunbergii.

The brilliant autumn coloring and profuse fruiting of this species recommend it for planting, either singly or in masses. Low-growing, 3 to 4 ft., and graceful in outline..



Compass Cherry.

While it is doubtful if the Compass cherry will ever be extensively planted in Wisconsin for its fruit, its early blooming habit recommends it for ornamental planting.

side is the most desirable place for planting, to ward off too much moisture and snow.

This variety does not require any artificial fertilizer, for by supplying a fertilizer, the plant would naturally develop more into growth of foliage than of flower.

The Campanulas and Foxgloves are greatly admired by all flower-loving people and are worthy of a place in any garden as specimens of showy and attractive flowers which are fully developed in June and July.

Regarding other biennials, I will mention Rudbeckia Triloba, Subtomentosa, Hirta, Brittonii with especial attention to the Rudbecka Triloba, which is not yet known as a very common variety of the Thistle family, (Compositae) under cultivation. I have cultivated this variety for cut flower purposes and I think there is nothing prettier than this miniature of the sunflower. This plant grows to a bushy height of four to five feet with about 800 to 1,000 fully developed blossoms at one time, through the month of August. The culture does not require very much attention, being sown during May in open, common garden soil and developing into strong, hardy plants 'til the following Spring, when they should be transplanted to their places of permanent growth. This plant is adaptable to any condition of the soil, whether wet or dry.

I have briefly discussed and have, I trust, produced a conception of the value of biennials to the horticulturist, not only from a practical point of view, but from a floral one also.

DISCUSSION.

Mrs. Howlett: Are there any varieties of the Campanula that are perennials?

Mr. Illenberger: Yes, I consider most campanulas are perennial, except one variety, the medium varieties, that are annual or biennial; all the rest are perennial.

Mrs. Barnes: I would like to have explained what an herbaceous perennial is, so that we will understand what is meant by that.

The President: The understanding I have of herbaceous perennials is that they die down to the ground in the winter and come up again in the spring.

Mr. Illenberger: From the same stem and same root; the old tops die and the roots send up a new growth.

The Secretary: Perennial Phlox is an herbaceous perennial.

Mrs. Barnes: But does the perennial Phlox die?

The Secretary: The top dies.

Mr. Illenberger: Young growth from the old plants; new crowns.

Mrs. Howlett: New crowns, but not new roots.

Mrs. Barnes: I would like to ask why the pansy is not an herbaceous perennial, if the roots live in the ground over winter.

Mr. Illenberger: They grow from the same stem. It never would die in case the climate would be suitable for it, they never would lose a leaf at all.

Mr. Toole: There are many plants that we grow annually, losing sight of the facts that they are perennial, for instance, the petunia. I suppose what brings this thought to mind now is the question of how to classify the exhibits. But those that are positively known and grown as annuals, we class them as annuals, even though technically they might be arranged otherwise.

Prof. Sandsten: I was going to remark on the question of definition, I am afraid if we get pinned down to a definition we will get stuck. I think we had better leave it alone.

Mr. Toole: I disagree with the Professor on that, because I remember once a member of our Society was reading a paper on perennials, etc. and he made use of the term "herbaceous shrubs." I called his attention to that and he was satisfied that he was correct. It was referred to Prof. Goff and he said there was no such thing as herbaceous shrub, a shrub is not herbaceous, and I think we can settle in our minds what is meant by herbaceous perennials. The roots and crown live through the winter but the tops die down, because they are herbaceous, like the annuals. There are many things that are hard to place, but there are very few on the border line, we do not need to ask about them. Anything that has a herbaceous top that dies down and the root lives, that is a herbaceous perennial.

Mr. Smith: Are not many of our common plants which

are perennials when we go a little farther south, annuals up here, simply from the fact that our winters are too severe? Like the castor bean, for instance; down in the Tropics it is, you might almost say, a tree, here it is an annual.

The Secretary: The tomato is perennial in some climates.

AFTERNOON SESSION.

SOWING SEEDS OF ANNUALS.

MR. ALBERT MEIER, Madison, Wis.

Under this term may be included all knowledge respecting the propagation of plants by means of seeds or spores. In general literature and common speech a seed is that part of a plant which is the outcome of flowering and which is used for propagating the species. In the technical or the botanical sense, however, the seed is the ripened ovule. The seed contains an embryo which is a miniature plant. The embryo has one or more leaves (cotyledons), a bud or growing point (plumule) and a short descending axis (caulicle). From the caulicle or stemlet the radical or root develops. This embryo is a miniature dormant plant. Each embryo is the result of a distinct process of fertilization in which the pollen of the same or another flower has taken part.

The ovule is contained in the ovary. The ovary is the seed case or pericarp. The pericarp with the parts that are amalgamated with it is known technically as the fruit. In many instances there is only one seed in the fruit and the seed and its case may adhere and form practically one body.

Germination is the unfolding and the growing of the dormant or embryo plant. The first visible stage in germination is the swelling of the seed. The seed case will burst by the pressure of a tiny white shoot from beneath. We say that the seeds have sprouted or have commenced to germinate, and have taken the

first visible step toward developing into a plantlet. At a suitable temperature the living cells of a certain part of the seed begin to increase in size and to divide, causing the tiny shoot to burst through the seed case. Germination is completed when the young plantlet is sufficiently developed to live without further aid from the seed.

CONDITIONS REQUISITE FOR GERMINATION.

In order that seed shall germinate they must be supplied with moisture and be given a definite temperature. The requisite temperature and moisture vary with the different kinds of seed.

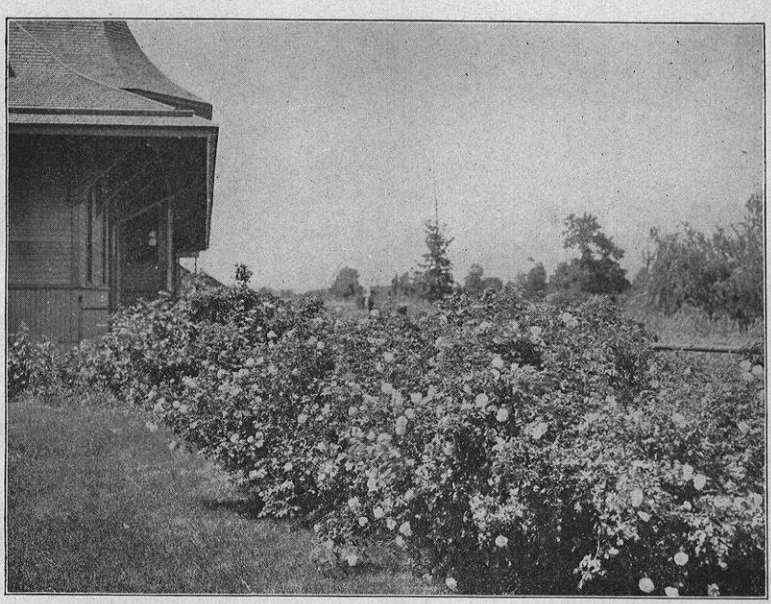
The seeds may be planted in any medium which supplies the requisite conditions. Although seeds are ordinarily planted in soil such practice is not necessary to germination. However, the ground may supply the necessaries for germination and it also supplies plant food for the young plantlet when it begins to shift for itself, and furthermore the plants are in the positions which they are desired to grow.

As a rule the sooner a seed germinates after it is planted the better for it is generally in danger of being destroyed by insects or fungi and the plantlet probably loses vigor by too slow development. Weeds may also be gaining a start if germination is delayed. We should, therefore, treat both the seed and the soil in a way that favors prompt germination.

Compacting the soil about the planted seeds hastens germination. When the soil is becoming drier day by day, as it often is in spring, compacting the soil about planted seeds materially hastens their germination and often secures germination that without the compacting might be indefinitely postponed. The hoe, the foot, a board or the hand may be used to compact the soil over planted seed.

Planting should be deferred until the soil becomes warm. Seeds cannot germinate promptly until the temperature of the soil in which they are planted approaches the optimum for their germination.

Excess of water in the soil retards germination by restricting the supply of oxygen and sometimes keeping the soil cold. Seeds should not be planted in soil wet enough to puddle about them, nor should the soil in which seeds are planted be so freely



A hedge of Rugosa roses.

A bed of peonies.

watered that the seeds remain surrounded with liquid water, thus shutting out the normal supply of oxygen.

Germination may be hastened by soaking seeds before planting. Soaking is most important with seeds having seed cases that do not readily transmit water at growing temperatures, such as the Canna. Germination may also be hastened by cracking or cutting away part of the seed case.

Seeds may fail to germinate from a variety of causes even when exposed to the proper degree of warmth, moisture and oxygen. They may be too old, they may not have been sufficiently matured when gathered, they may have been too dry or they may have been stored while damp and thus subject to undue heating, or may have been destroyed by insect or fungi, either before or after maturity. Defects of these kinds are not always visible.

DETAILS OF SOWING SEEDS OF ANNUALS BOTH IN-DOORS AND IN THE OPEN.

Seeds of annuals may be sown under glass or in doors from the first of March until the first of May, or even later. Sow in pans or trays two inches deep. Fill the pans or trays about even full of light soil which should be loam and leaf mold half and half, press down with a piece of board or block which will carry the soil one-half inch below the top of the tray, give the soil in the tray a good watering, sufficient to wet the soil through to the bottom. In half hour sow the seed. We wait to give the soil time to dry on the surface so that the seed can be lightly pressed into the soil with the board without sticking to it. After we press the seed down we sift on the covering of soil. The question is often asked—"How deep should seeds be covered?" As a rule the covering may be about the thickness of the seed; many seeds that are sown out doors are covered about six times their depth. With annuals in doors we sift the compost on until the seeds are out of sight and that is sufficient. Another pressing down of the covering and the least amount of watering will do as you now have only the thin covering to wet.

The thickness of the seed in pans or trays must be entirely a matter of judgment; it is poor economy to sow very thickly to save space; it is better to be on the safe side and sow thinly for if crowded at the start it is a poor beginning for the little plant.

Seeds when first sown should be kept at an even degree of moisture with no extremes. The trays should be kept in a shady place until the seedlings are above the ground when they should get the full light and not be allowed to draw up for want of light and ventilation. A temperature of 55 to 60 degrees brings the seeds nicely and keeps the young plants growing until time to transplant. There are quite a few Annuals that can be sown out doors or in the open, such as Candytuft, Mignonette, Zinnias, Marigolds, Nasturtiums, Verbenas, Phlox, etc. They should be sown as soon as possible after the ground is dry enough to work. The ground should be spaded and all lumps broken, well raked, the surface made fine and level, the seed sown thick in patches or drills, and the corner of the rake will make the drills half to one inch deep. Out doors the seeds are planted deeper than in doors in order to keep a uniform supply of moisture, a depth of three or four times the seed is necessary.

The finer and moister the soil the shallower the seeds may be planted. After covering the seed with soil press down the soil with a board or rake and cover with some boards to prevent the seeds from being washed away by heavy rains and also prevent the soil from drying until the seeds have sprouted. If the soil bakes as it sometimes does a little sprinkling of sand on top will be a great help to keep the soil loose.

For early flowers better results in germination are obtained when the seeds are sown in a specially prepared seed bed or frame. The conditions may be better, you are able to protect the young plants from cold and insects, and in transplanting you may select the strongest and best seedlings. The seed bed or frame should be in a sheltered place where it can be visited frequently and where water may be supplied when needed.

In handling seedlings in a seed bed or frame one must be careful that the seeds are not too thick and they do not suffer from lack of light or else the seedling will become spindly and weak.

DISCUSSION.

Mr. Smith: I would like to ask with what you cover the seeds?

Mr. Meier: Light soil; sand will do. Take a newspaper, or

piece of glass, anything. If you put glass on it you will have to put something over to shade it, for if you have the sun on it it will dry it out.

Mr. Smith: Does this description apply to seeds planted in the greenhouse?

Mr. Meier: Well, in the house, or greenhouse, same thing, or in frame seed beds, or frame outdoors. Of course, planting in the open, you must plant them deeper.

Mr. Smith: The object of covering, then, is to keep the moisture in?

Mr. Meier: Yes.

A Member: In sowing in boxes you want to have a little space between the top of the soil and top of the box, so that you can put it outdoors and still have room at the top to cover the box.

Mrs. Howlett: Would it be better to sow the seed broadcast, or in little drills in boxes?

Mr. Meier: It makes no difference which way you sow the seeds.

Mrs. Howlett: When you have them in drills you can keep the soil loosened with a fork or some other instrument, and I think they grow better with the soil kept loosened.

Mr. Meier: In trays we sow them broadcast; outdoors they are mostly sown in drills.

Mr. Smith: Where you are planting quite a number of different varieties, do you plant side by side, just as it happens, or do you plant certain varieties, one after the other?

Mr. Meier: We sow but one variety in a box, but it does not make any difference how many you sow, the seed will all come up; but large seeds ought to be planted together and finer seeds should be planted together, you can handle them better.

Mr. Smith: In flower seeds particularly, some kinds will come up in a few days, while other will take perhaps a couple of weeks. Now, if we follow the instructions of Mr. Meier and cover your seeds, say, you have planted marigolds, which come up in about four days under favorable conditions, while there are others with smaller seeds that will take two weeks, or if you have a lot of marigolds in between, some of them come up in two weeks, it is not the easiest thing in the world to keep the kind that are slow in coming up covered while the others are up and an inch high as they will be. Whereas, if you assort the

seeds, plant the quick germinating varieties side by side and then those that are slower germinating by themselves, we can cover or uncover as occasion requires, the various kinds, which will make it much more convenient.

Prof. Moore: We find most seeds do very well in a cigar box, the flat, narrow boxes. Wide shallow boxes should not be used, because they dry out too quickly. Take the cigar boxes and after sowing, tamp down, put a common newspaper over the top, and, having punched a few holes in it, then we water right on top, soaking it, and letting it go down through the hole until it fairly saturates the soil. In that way we have very little difficulty in respect to the seeds being washed out of the soil. With the ordinary sprinkling can you wash out a great many seeds, and we find the newspaper plan is a very convenient method of watering. If covered, as Mr. Meier suggests, with glass, so as to retain the moisture, it will not be necessary to water frequently.

Mrs. Howlett: I find a good way to water is to set the box or tray into a basin of water, so that the moisture soaks up from beneath.

RATIONAL ORCHARD MANAGEMENT.

PROF. E. P. SANDSTEN.

The planning and planting of a new orchard is only the first step in the successful production of fruit. The subsequent care of the orchard is more important though it is generally neglected not only by the farmer, but also by the average fruit grower. Most of us have gotten into the habit of considering our work done when the trees have been planted and then expect nature to produce the harvest. Few people realize that success in fruit growing as in any other agricultural pursuit requires constant care and study. Further we seem to have forgotten that fruit trees are as susceptible to culture and care as any crop that can be raised on the farm.

While no dogmatic rule or rules can be laid down for the proper management of a given orchard, there are nevertheless a few

A portion of the aster field at "Pansy Heights," Baraboo, the home of Fres. Toole.

"A typical modern low-headed apple tree—easy to cultivate, spray and pick the fruit."—E. P. S.

principles in orchard management that have universal applications. We will consider these principles under their appropriate heads.

Cultivation.—As a general rule all orchards should be cultivated whether in bearing or not. The cultivation should start early in the spring as soon as the ground is in a satisfactory condition for tilling, and continue until about the midd'e of July when a cover crop of some kind should be sown. It is preferable to plow the orchard early in the spring and plow it as deep as possible, but not so as to interfere with the roots of the trees. Considerable difficulty is encountered in old orchards that have not been previously cultivated, and care must be taken so as not to injure the roots by plowing. Following the plowing should come the disk harrowing. The object of disking the land is to get it in a perfect tilth. With the disk harrow one can get as near to the trees as advisable without injuring them. Following the disk harrow should come the light smoothing harrow. This tool should be used throughout the season, and there is no need for deep cultivation. The orchard should be dragged after each rain or at intervals of two weeks so as to keep the top soil loose and to kill weeds. Thorough cultivation will prevent the soil from drying out and will protect the orchards during the dry spells. It will also permit the air to penetrate deeply into the soil making the same more hospitable to the plant roots. Cultivation also materially aids and stimulates the wood growth which is essential to the trees. The importance of cultivation can hardly be over estimated in the production of fruits.

There are many orchards so located that clean cultivation is not advisable. Orchards situated on steep hillsides cannot be successfully kept in clean culture, and it is therefore necessary to put the orchard in sod in order to prevent the washing of the land. In such orchards, the mulch system should be practiced as nearly as possible. That is, sow down the orchard to clover or grass and cut the same and leave it under the trees. However, even in steep hillside orchards it is advisable to cultivate strips between the rows or to keep the orchard in cultivation for a year or two and afterwards seed it down. If the hillside orchard is plowed in strips, the plowing will soon terrace the hillside, and when this is accomplished, the orchard can be put under clean culture. It is sometimes necessary to put the orchard in sod if the tree growth is too rapid and rank in order to check this tendency, but it should

not be kept in sod any longer than is necessary, or until this defect is remedied. The great objection to sod orchard is that the root system becomes shallow; that the orchard suffers from drought and that the sod or mulch provides an excellent place for insects and diseases to hibernate in. Clean culture reduces the spraying operations in the orchard and insures better fruit.

Cover crops.—It is not advisable in this climate to leave the ground bare in the orchard during the winter. For this reason cover crops should be sown about the middle of July, so that the cover crop may cover the ground completely before the winter sets in. The cover crop abstracts considerable moisture from the soil and checks the wood growth, thus hastens the maturing of the wood in the fall. Further it protects the soil during the winter in holding the snow and prevents deep freezing of the soil. Again, the plowing under of the cover crop in the spring adds humus to the soil and puts it in better tilth.

The kind of cover crop to use depends on the character of the soil. On ordinary orchard soil that is reasonably fertile an oats cover crop is the best. Being an annual crop it will not survive the winter and start to grow in the spring, but it serves the purpose for which it was intended. If the land is poor in nitrogen some leguminous crop should be raised, preferably hairy vetch or clover. Hairy vetch being best adapted as it grows late in the fall and early in the spring and provides a heavy mat of green herbage which can be plowed under in the spring. It is difficult to get a reasonable stand and growth of clover in the fall and hence this crop is best adapted to orchards that are intended to be put down in grass or clover for a year or two. Crimson clover is not hardy in Wisconsin and cannot be recommended.

Pruning.—Pruning should be looked upon as an annual duty and of as much importance in the orchard management as cultivation. By pruning annually only small branches need to be removed, and the trees will suffer very little from the operation. Further if the pruning is done systematically, very little is required each year especially after the trees come into bearing when it is only necessary to cut out interlacing branches and water sprouts. This is especially true of cherries which should be pruned as little as possible, due to the fact that the wounds do not heal over rapidly and the wounds furnish starting points for wood-destroying fungi. If large branches are to be cut off they should be painted immediately after cutting so as to protect the

wound. The cutting of branches should be done as closely as possible to the stem or main branch. Stubs left on the trees are frequently the cause of black heart and decay.

Spraying.—While much has been said and written on this subject it is one that is more important than almost any other operation in the orchard. It is an insurance against the depredation of insects and fungus diseases, and no intelligent fruit grower can afford to neglect this work. The first spraying whether it be apples, cherries, or plum trees should be done in the spring before the buds are open, and at a time when they are swelling. For the first spraying 3 pounds copper sulfate to 50 gallons of water should be used. It is advisable to add 3 or 4 pounds of lime as an indicator so that the operator can see what portions of the trees have been sprayed. The second application should be given after the petals have fallen using the Bordeaux mixture, standard solution, to which should be added either one-fourth pound of Paris green or three pounds of arsenate of lead. The Paris green and arsenate of lead are used to kill the curculio and the worm of the codling moth. It is very important that these two insects be attended to at this time, especially that of the worm of the codling moth as it is the first brood and if it is permitted to live, the second brood will be large and do considerable damage. The third application should be given about 10 days later, using the Bordeaux mixture and the poison. The object of this application is to catch any of the remaining worms of the codling moths and the curculio. Ordinarily three sprayings are sufficient, though there are times when a fourth and even fifth should be given.

As has been said, the importance of these operations in an orchard can hardly be over estimated and no fruit grower or farmer for that matter can afford to neglect them. The time and money required for the work is relatively small when compared with the results obtained.

DISCUSSION.

Mr. Toole: I would like to ask in regard to spraying, whether it can be overdone This year I have seen some apple trees on which the apples looked perhaps more rusty than we thought those varieties should show, and we were told that spraying was the cause of it, and yet I am a little doubtful, myself. I would like

to know more about that. Is spraying likely, if you keep it up, to do about as much harm as good, not in regard to the insect, but in regard to the fungous diseases?

Prof. Sandsten: I will say first, that I would rather eat an apple that is rusty than I would one that is wormy. Now, the fact of it is that spraying has received a black eye with many growers because of such results as Mr. Toole has spoken of. It may be due to the Bordeaux mixture and it may not be due to it. Now, there are conditions in the spring that favor russeting of apples when no Bordeaux has been used, but there are also cases where Bordeaux will produce a russeting effect. Now, if Bordeaux is properly made and applied, it should not russet the fruit, but the trouble is, as I said before, that three-fourths of our fruit growers do not know how, or they do not, at least, prepare the Bordeaux mixture properly. I think all of us know how to do it if we follow directions; we have the directions, but the trouble is, we do not take the pains to do it. That is where the trouble lies; we know better, but we do not do it right.

A Member: What do you call a low-headed tree?

Prof. Sandsten: Personally, I should like to see an apple tree as low to the ground as you can get it, that is to say, head it from a foot up to three feet; I should prefer a foot, right close to the ground. They are less apt to be affected by the wind. I know nurserymen do not like it.

The President: We do not like to have them down to a foot; that is pretty low.

Prof. Sandsten: I know, we cannot grow as many apple trees to the acre; they are harder to grow and they are worth more, and that was the point I was trying to bring out. Pay half a dollar anyway for each tree and get them low headed.

Mr. Smith: I would like to ask if the apple trees that are headed one to two feet from the ground are not more liable to have those sections or branches, if we may call them that, twisted off by heavy winds, than if headed out, say three feet, where the tree as a whole, gets a little spring from the trunk, and does not have to bear the full force of the wind in the section in connection with the crotch?

Prof. Sandsten: That sounds logical enough, but what do you do, Mr. Smith, when you are out in a storm; don't you lie down flat on your stomach and try to avoid it?

Mr. Smith: I never was out in such a storm.

Prof. Sandsten: Further, it is a question of pruning. If you prune a tree low while it is young you will get the branches tight to the trunk; if you do not, you will get a forked tree. It is a fact, the lower the tree is headed the more secure it is against the wind.

Mr. Birmingham: If you do not head cherry trees more than a foot from the ground, how are you going to cultivate them? You cannot get within eight feet of them.

Prof. Sandsten: O, yes, you can get as close as you want to with a disk harrow. A cherry tree does not go down very far; it also goes up in a vase-like shape, and you can cultivate a cherry tree if you head them a foot high, I am sure. You cannot get in there with a one-horse plow, but you can get under very easily with a disk harrow.

Mr. Henry: I wou'd like to ask in regard to the time of pruning. I find in our locality a good many of the people prune whenever they find they have a sharp saw and a little ambition, and I would like to know if there is any time that it ought to be done or ought not to be done.

Prof. Sandsten: Judging from the pruning that is done, I should say the ambition must be very periodic indeed, but the fact is that ordinary pruning—cutting off a branch—can be done at any time. Ordinarily the best fruit grower, the one that has a good, sharp pruning knife or shears, whenever he sees a branch that should be cut out, he cuts it out regardless of the season. Heavy pruning should be done while the tree is dormant; it affects the general life of the tree least at that time, but little twigs can be cut off at any time of the year.

Mr. Toole: Ought you not be more particular as to the time of the year?

Prof. Sandsten: I said, heavy pruning should be done while the tree is dormant; we prefer to do our pruning early in the spring.

Mr. Loewe: Prof. Sandsten refers to the curculio; is there any way in which you can spray to prevent the curculio?

Prof. Sandsten: Yes; they have to eat, like the rest of us, and you can poison them by using arsenate of lead at the rate of 2½ to 3 pounds to 50 gallons of water, and about the time when they begin to get around, simply spray plum trees with that mixture and you will get them, as a rule, but I still stick to my proposition, that you will not have very many curculio if you

practice clean culture from the very fact that they hibernate in the ground, but you may have the trouble that many have, you may have a "buggy" neighbor, who does not take care of his own orchard and they get from his field into yours.

Mr. Kanute: I would like to know what causes cherry trees to die in some localities while in others they seem to be nice and green and fresh?

Prof. Sandsten: They die from many reasons. It is very difficult to answer that question, because the killing or dying may be due to a number of causes, that it is very difficult to say exactly why, even if a person were on the place, and it is doubly difficult to tell why a tree dies without knowing anything about the conditions. There may be simply a spot on a piece of ground where cherry trees die; we have cases in our own orchards where we cannot tell what the trouble is.

Mrs. Howlett: I would like to know what it is that injures the cherry trees where there is a perforation in the bark and a gum exudes from it and the branch dies from the point where the bark is perforated?

Prof. Sandsten: That is quite a common occurrence in many sections of the state, especially in a section where the moisture is atmospheric. You will have less trouble on the peninsula here than in the rest of the state, but we have that occurring in many sections of the state on higher land, when the ground is uniformly drier, the bark seems to shrivel up and from the crotches and trunk itself a gummy substance exudes.

Mrs. Howlett: It seems as if the bark were perforated by some insect.

Prof. Sandsten: Well, generally a woodpecker will pick those holes looking for the insects.

Mrs. Howlett: They are very small.

Prof. Sandsten: There is a bark disease that causes the first trouble and there may be insects getting into the bark afterwards.

Mr. Toole: If we have to pay from 10 to 15 cents a pound for arsenate of lead, ought we not to make our own preparation?

Prof. Sandsten: No, you can get arsenate of lead much cheaper; you can get it now for 11 cents a pound and it is just as cheap as Paris green, if not cheaper, and it is safer to use; it will not hurt the foliage.

Mr. Birmingham: On the younger apple trees I notice little green flies; will the Bordeaux mixture protect against those?

Prof. Sandsten: No; Bordeaux mixture is for fungous diseases; it is not an insecticide. You should use kerosene emulsion or tobacco juice. They are what are called apple aphis.

DOES SPRAYING PAY?

MR. J. G. BUEHLER, Twin Bluffs, Wis.

From my own experience of ten years I would say that spraying pays but that it only pays when it is done thoroughly, with proper material and at the right time, for fungus diseases and insects that you wish to subdue. From a scientific or chemical standpoint I can give you nothing new in spraying formulas, only what is recommended in horticultural literature. Every one who provides for a family and has the opportunity to grow fruit for family or commercial uses should have some knowledge of combating insects and diseases as these are always present in a greater or less degree from one end of the continent to the other, especially in the older fruit growing localities. It is a well known fact that spraying does pay, and while the results are not always immediately in evidence, we often reap the benefit in later crops. It often means the difference between a good crop and no crop or at least inferior fruit. Right here I can speak from a personal experience, as a year ago I bought the fruit from three orchards; the first orchard I sprayed once as soon as the petals had fallen but that was the only spraying the orchard received and I did it at my own expense. From this orchard I gathered nearly 80% of No. 1 fruit, 10% of No. 2 and only about 10% that was not marketable. I felt well repaid for my expense in spraying and there is a fair crop in that orchard again this year.

In the case of the second orchard I bought, the owner thought he could not afford to spray with Bordeaux but would spray with Paris green alone and wanted to hire me to do the spraying for him but as I could not find time and did not care to spray with Paris green alone, the orchard was not sprayed at all. The result was about 80% of scabby apples that hardly passed for No. 2 grade and 20% not marketable and no fruit

this year. Had he sprayed with Bordeaux and Paris green it would have paid him 500% on the investment and he might have had apples again this year. This orchard is one-half mile from the first named.

The third orchard was well sprayed as the owner was careful in his work and followed advice closely. The orchard is just coming into good bearing, most of the trees nine years old. I contracted for the crop early in the season at $1.00 per barrel for McMahan and Wealthy and $1.25 for Northwestern Greening on the tree. I sold the entire crop for $3.50 per barrel, doing the picking, packing and hauling myself. This orchard yielded about 98% of marketable apples and many who saw the orchard before I commenced harvesting the crop, said it was the finest crop they had ever seen.

I consider that there are three essential points in fruit growing; first is pruning, the second spraying and the third cultivation and fertilization and each without the others is incomplete. To spray without pruning would be a waste of material on dead branches and superfluous wood. This extra wood also hinders the development of the fruit by shutting out the sun-light and air, which are essential; also rendering the trees more liable to insect and fungus attacks, for when once fungus gets a strong foot-hold in an orchard it will get into the older wood and also affect the fruit spurs for the following crop and this point accounts largely for crop failures.

Spraying must be considered a very important feature of fruit growing but it must be thoroughly and immediately done for a number of years. Its universal practice will tend to revolutionize fruit growing and as an element of success cannot be over-estimated.

I feel like criticizing some of the statements made that Wisconsin is not a fruit state. Like every other state in the Union it has favorable and unfavorable localities but I believe the time is near when Wisconsin will be recognized as a fruit state. Last year considerable money was lost by the apple dealers but not on Wisconsin apples because these were too good.

Blackberries at Bayfield, Wis.

Duchess apple tree 4 years after planting, Bayfield, Wis.

DISCUSSION.

The President: This brings up the question of spraying again and questions may be asked Mr. Buehler upon the subject of spraying.

Mr. Bingham: I would like to ask how many applications he would advise?

Mr. Buehler: Three applications; the first to be made before the blossoms came out, or just as soon as the fruit buds show; then again just as soon as the petals have fallen, and ten days later another application.

A Member: Will spraying kill the bark louse?

Mr. Buehler: No, not with the Bordeaux, the Bordeaux does not kill the bark louse; you must use the kerosene emulsion for that, and watch your time. There is only a certain time that you can kill them, and that is along about the middle of June I think, the middle or latter part of June.

Mr. Hatch: I would like to ask Prof. Sandsten what to do for the bark louse; whether you could use lime, sulphur and salt?

Prof. Sandsten: The bark louse can be killed in the winter by using the lime, salt and sulphur wash.

Mr. Hatch: Have you ever done it?

Prof. Sandsten: I have not done it, but some people have done it in our orchard.

Mr. Hatch: Is salt essential to the mixture?

Prof. Sandsten: No, not necessarily; you can eliminate the salt.

A Member: I would like to ask Mr. Bingham what they do in Michigan?

Mr. Bingham: Use sulphur and lime, do not need to use the salt.

Mr. Bingham: What would be the result of an application of pure kerosene?

Prof. Sandsten: If you spray with kerosene you may not have any bark lice and also you may not have any trees. Ordinarily kerosene is very injurious to trees; but if you can get what you call crude petroleum, that is, the natural oil, without being clarified, having a certain specific gravity, you can kill

the bark louse with crude petroleum. You will kill the louse with kerosene, but you will also kill the tree.

Mr. Bingham: We used that on our orchard; we did not notice any bad effect except on the Japanese plum, and we killed a great many lice.

Prof. Sandsten: Oh, you will kill the lice all right. I have no doubt it can be done, but I do not advise it.

The President: They are not all as careful as Mr. Bingham.

Mr. Bingham: We had trees of some sort that did not do very well; bark lice were very thick, crusted the bark all over; we gave them a good application. Of course I would not recommend it to a man unless he is very careful in using it.

Prof. Sandsten: It is better not to recommend it at all.

The President: We are very glad to have this experience of Mr. Bingham, but, as Prof. Sandsten says, we want to be very careful about it.

A Member: How is lime and sulphur applied, by a spray pump?

Mr. Buehler: Yes, it can be applied with a spray pump.

COVER CROPS—THEIR USE IN ORCHARD MANAGEMENT.

J. G. MOORE, Asst. Prof. of Horticulture, Univ. of Wis.

A discussion of the subject of cover crops presupposes that clean culture is followed as opposed to either the sod, or grass mulch system in handling the orchard. We will not attempt to discuss here the relative merits of these, but merely consider the part played by the cover crop in the clean culture system. Almost every Experiment Station in the country has done more or less work in an endeavor to determine the proper methods of handling the cover crop, and the various results which are brougth about by its use. The different phases studied by these experimenters extend from the ameliorating effects upon the brought about by its use. The different phases studied by these soil to the likes and dislikes of various orchard crops for the cereal used in producing the cover.

It has been found that clean culture practiced throughout the entire growing period, does not result in the best conditions for the production of fruit, and for that reason, the cover crop has been employed to counteract unfavorable conditions.

In the use of cover crops there are always one or more chief reasons why the crop is employed; these we may term "objects" for their use. Ordinarily they may be classified under the following heads:

To hasten the ripening of late wood growth, and, in a measure, prevent top-killing.

To prevent deep freezing of the ground, and thus avoid root-killing of the trees.

To prevent washing of the soil by heavy fall and spring rains.

To lessen evaporation in winter when there is no snow on the ground.

To hold soluble plant food in the soil, and to increase the amount already there.

To add vegetable matter to the soil so as to increase its water-holding capacity, and give it better tilth.

While all of these "objects" are of more or less importance each year, some one or two stand out more strongly than the rest.

These will vary from year to year, and in various localities, which makes it impossible to give any hard and fast rule concerning the practices to be followed with cover crops. It therefore becomes necessary for each fruit grower to study his own conditions, and having acquainted himself with the results which may be expected in following out a certain procedure, he must employ those methods which, in his judgment, will be most likely to give the desired result.

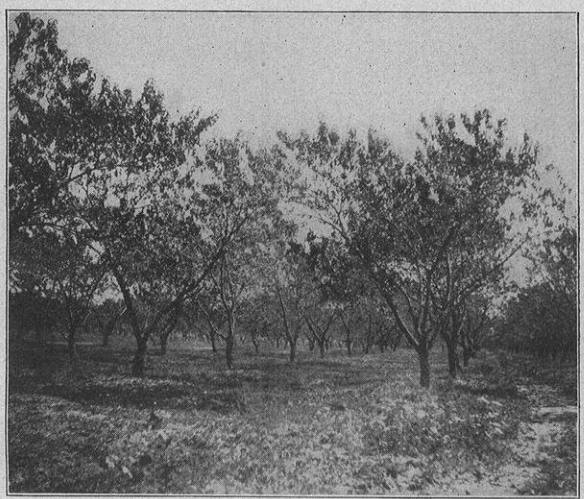
The ripening of wood and the prevention of late summer growth as a means of preventing winter top-killing is one of the most important phases of orchard cultivation with which the Wisconsin fruit grower has to deal. If we were to continue the cultivation of our orchards throughout the entire growing season, there would be a tendency for the trees to produce a late growth which would not ripen before the advent of killing frosts. The result would be that a large proportion of this growth would be killed back which is not at all desirable in the growing of well-formed fruit trees. A cover crop first acts as an absorbent of moisture, reduces the moisture content of

the soil, checks the growth of the tree, and hastens the ripening of the wood, thus enabling the trees to go into winter quarters in much better condition than it would otherwise.

The prevention of deep freezing of the ground to avoid root-killing is also very important in this state. The dying of trees soon after growth starts in the spring may very often be attributed to root-killing. If our orchards are to be left barren of any vegetation during the winter months, there will be nothing to hold the snow upon the surface. The strong winds will drive all that falls there into drifts along the fences, and the soil will be subjected to deep freezing. On the other hand, if a good cover crop be grown, a large proportion of the snow which falls will be held upon the ground, thus furnishing a blanket, which in conjunction with that afforded by the cover crop itself, will, in most cases at least, reduce the depth of freezing one half, and in some cases, even a much greater reduction has been experienced.

Used as a blanket, the cover crop also exerts other influences, which indirectly affects winter-killing. It reduces to a large extent the evaporation of moisture from the soil during the winter months, especially when we have little or no snowfall. It is a well known fact that a great deal of winter-killing of trees in dry climates which have low temperatures during the winter, is due not so much to the low degree of temperature alone, as to the drying out process which is occasioned by the strong dry winds. Experimentation has proved that there is always more or less sap-movement in the trees during the winter. If the ground be so dry that the roots are unable to supply the tops with sufficient moisture to prevent the cambium being dried out, there will be noticed the next spring a large amount of killing back which was primarily due to the dried-out condition. When the cambium has become thoroughly dried it is impossible for it to resume growth in the spring, and as a result we have dead twigs, which are not only useless to the tree, but also prove a menace in trying to preserve the equilibrium between the food-gathering and leaf-bearing areas. Such a condition makes the problem of pruning much more difficult. As previously stated, the cover crop is a large factor in preventing this condition and no orchard should be allowed to pass the winter without some form of vegetation on the ground.

Oats as a cover crop in a plum orchard.



A cover crop of oats in a plum orchard. Photographed in November.

Cover crops exert a great influence upon the supply of plant food in the soil, its retention and the addition of vegetable matter. I think we are safe in saying, however, that the addition of vegetable matter is probably of greater importance than the retention of plant food. Productive soils must contain a large amount of vegetable matter. Orcharding is a system of cropping which does not naturally return much vegetable matter to the soil. If clean culture, without the cover crop, is practiced, we soon find that the soil is depleted of vegetable matter and unless a large amount of barnyard manure be applied, the productiveness of the orchard soon reaches a very low percentage of what it should be under ordinary conditions. Taking into consideration the other benefits derived from the use of a cover crop, the addition of vegetable matter by this method is probably the cheapest which can be employed.

We have already spoken of the use of the cover crop as a food supplier. Personally, I would place this under the secondary benefits of the cover crop rather than among its more important phases. There is no question but that the cover crop may be made to supply a very large amount of plant food. In its use for this purpose, however, a great deal of precaution must be exercised or the evil effects will outweigh the benefits. The plant food most largely supplied by cover crops is nitrogen, and while nitrogen is an essential plant food and very necessary to a vigorous, healthy growth, an over supply in the soil is a drawback to fruit production. Nitrogen favors a large vegetative growth. The activity of the tree cannot be turned strongly in two directions at the same time, and if the supply of nitrogen is sufficient to cause the tendency of the tree towards a large wood growth, then we can expect that the production of fruit will be materially reduced. Then too, an over supply of nitrogen would have a tendency to induce late summer growth which would be very apt to suffer during the winter. It is not wise to grow nitrogen-gathering crops as covers continually. Such a procedure would, on ordinary soils, soon give an over supply of nitrogen in the soil, and result in the conditions given above. While cover crops do increase the amount of plant food in the soil they should never be considered as fully supplying the needs of the orchard, or because they are used the application of barnyard manures and other fertilizers be abandoned.

In Wisconsin where lands are more or less hilly or at least rolling, a great deal of difficulty is experienced in preventing washing by heavy fall and spring rains. In fact, even in summer, how to prevent the washing of soil and the gullying out between trees, becomes a very serious question in clean culture orchards in which the site has considerable slope. Considering the washing which takes place during the summer, it is all the more necessary to guard against the same condition during the winter and early spring. The use of cover crops therefore, becomes practically essential on such lands if clean culture is to be practiced during the summer.

HANDLING OF COVER CROPS.

One of the questions most often asked concerning cover crops is "When should the crop be sown?" As with all other phases of orcharding, this depends upon conditions and not infrequently upon conditions which are largely conjecture. The one factor which will most largely influence the time when a cover crop should be sown for any particular kind of fruit is the proper amount of soil moisture during the late summer and fall months. One of the chief reasons for sowing the cover crop is the regulation of soil moisture during the latter part of the summer in an attempt to control the wood growth of the season. If the season be especially moist, and the indications are that it will so continue then the cover crop needs to be sown early so that the increased growth which the cover makes will draw upon the surplus moisture of the soil, and give the desired result as to wood-ripening. On the other hand, if the season has been particularly dry and the trees have practically ceased to grow, the cover crop need not be sown early, the chief concern being to have it on the ground in sufficient time to prevent any post-season growth caused by late summer or early fall rains. In a wet season, the tenth of July is none too early to sow the cover crop. Where there has been a long drought, as during the present summer, cultivation may continue as late as the middle of August, but as soon as sufficient rain has fallen to induce growth, the cover crop should be started. In ordinary seasons July 15th to August 1st, makes the best time for the cessation of orchard cultivation.

CROPS.

There is almost an endless amount of discussion as to the crops best suited for a cover for the orchard. It is almost impossible to get any two orchardists to agree upon this subject, and it is safe to say that no one crop is best under all conditions. Every crop has its particular advantages which may be those of season, amount of growth produced, resistance to frost, and other factors. For convenience, we divide the crops used as a cover into two chief classes, based upon whether or not they add any considerable quantity of food. We term leguminous crops, food-suppliers, and the others, non-leguminous or non-food-supplying. These classes are again divided according to ability to survive through the winter, and are called respectively hardy and tender crops. In the food-supplying hardy group, we have hairy vetch and crimson clover, the latter of which can only be considered as half hardy in Wisconsin. Of the tender food-suppliers, we have field peas, cow peas and soy beans. Of the hardy non-food-supplying class, the most important is rye, but wheat is occasionally used. The increased cost of the seed, and the fact that the character of the growth is much the same as rye, makes the latter more in favor. Of the non-food-supplying tender crops, oats, millet, turnips and rutabagas are the most used. The two latter might be placed in a class by themselves, due to the fact that they have tender tops which kill back with the frost, but roots which live over, and produce growth the following season. It is not necessary that each crop be grown alone, frequently two or more are grown in combination. Probably the most used combination is that of oats and Canada field peas.

Some of the chief advantages and disadvantages of the various plants mentioned above, in their use as cover crops are:

Hairy vetch, especially hardy; makes a rapid growth in spring; is slow to catch in a dry season; makes slow growth in fall; is low and does not hold snow as well as some of the other crops.

Crimson clover, can only be recommended in certain localities owing to the fact that it winter kills; where hardy, makes a very good cover if a catch can be secured.

Field peas, one of the best food-supplying crops; makes a

heavy growth; is especially valuable when mixed with some other crop which provides support.

Cow peas and soy beans. There is relatively little difference between these two crops; both are more tender than field peas, but stand up somewhat better after frost.

Rye, the best non-food-supplying hardy cover; does not make as much growth as oats in the fall, but stands up somewhat better during the winter.

Oats, probably the most used of all covers; comes quickly when sown; makes a good growth; stands up fairly well during the winter.

Millet, similar to oats, but less hardy and does not stand up as well.

Turnips and rutabagas add a considerable amount of humus but lack the essential qualities necessary for holding snow; especially valuable on account of the phosphoric acid they add.

AMOUNT OF SEED.

The amount of seed to be sown for the various crops is practically the same as that in ordinary field culture. We prefer to err on the side of having the cover too thick rather than too thin. There is little danger on the side of the former, save in the expense of seed, as the more dense the growth, the better it stands up, and therefore the better it holds snow.

The following amounts may be considered as indicating the quantity of seed to be used per acre:

Hairy vetch, 1 bushel; crimson clover, 10 pounds; field peas, 2 bushels; cow peas, 4 to 5 pecks; soy beans, 3 to 4 pecks; rye, 1 to 1½ bushels; oats, 1½ to 2½ bushels; millet, 6 pecks; turnips and rutabagas, 4 pounds.

It is well to harrow the ground just before sowing, and to put in the crop exactly the same as for the field conditions. Once in the ground, the crop needs no further attention until time for cultivation the next spring, when it is to be plowed under and the system of clean culture again taken up.

The benefits derived from the use of a cover crop will depend very largely upon the good judgment exercised by the orchardist, and while mistakes may be made owing to inability to tell just what the future conditions will be, the cover crop will in the

long run vindicate itself as a companion to clean culture in a rational system of orchard management. Occasionally an orchardist stops cultivating at the proper time, and allows Nature to provide him with a cover crop in the form of weeds. It would hardly seem necessary to advance any argument against such a procedure. The growing of weeds as a cover crop simply means that the labor expended in eradicating them will in time, more than offset the cost of using a legitimate cover. Some may say that the season of growth will be too short for the weeds to ripen seed. If this be true, it will only be a short time until those weeds which produce the cover are those which have a short season and ripen their seeds early, for unless this be so, the weed cover crop, must in a short time lose its source of seeding, and become a thing of the past. At the very best, a cover crop of weeds is an uncertain thing, and one which we believe should not be practiced by anyone who wishes to keep his orchard in the best condition at a minimum expenditure of time and money.

The President: Are there any questions you would like to ask Prof. Moore?

Mr. Toole: I would like to ask to what extent the danger from mice is enhanced by the use of a cover crop? I remember a number of years ago Mr. Barnes used oats and barley and the next year, speaking of his experience, he said that the straw had harbored mice and the mice girdled the trees. He attributed this injury to the cover crop.

Prof. Moore: The fact is, in most cases we expect very little trouble from mice on a field orchard that has had clean culture; might be a little on the edges, but that is very readily overcome by the fact that the mice work under the cover of the snow and all you have to do is to turn the snow slightly away under the tree.

Mrs. Howlett: I understood Prof. Sandsten to say that they would not use oats as a cover crop, and this gentleman, I understand recommends oats as a cover crop.

Mr. Moore: I hardly think Prof. Sandsten made that statement.

Mr. Birgham: I would like to ask Mr. Moore what we are going to do with the period between the time that he recom-

mends cultivating should cease, and the time to sow oats. We would not want to sow oats at that period; what are you going to do with that ground up to the time you sow oats; it will furnish you a cover crop of weeds before it is time to sow oats.

Prof. Moore: The question of sowing cover crop is quite a little different from the one I treated in the discussion; the difference lies in the fact that we stop cultivating much earlier. If I stopped cultivating at that time, I would sow oats; I do not know what your objections may be to sowing oats, or the cover crop, not necessarily oats. I see no particular disadvantage in sowing at that time.

Mr. Bingham: Does the wheat that we are growing in the orchard furnish as much humus as oats?

Prof. Moore: I would say that depends entirely on how good a stand of wheat you have. I would say, that what I saw in your orchard this morning would furnish as much humus as oats. This year we sowed our oats crop very late, about the middle of August; we got oats about 1½ to 2 feet high, sometimes higher than that, depending on conditions. Of course, that is not close to the trees, but out away from the trees, and those oats stand up along pretty well into the winter. They kill back some, but they stand the frost much better than you would expect; in fact, I have been very much surprised at the way they stood up.

Mr. Bingham: In orchards say where cherries had been carefully planted twelve to fourteen years ago and twenty feet apart, what would your method be of handling an orchard like that, I mean as to cover crop?

Prof. Moore: I would try to get what cover I could, simply for the addition of the humus. You understand you cannot get a cover crop in an orchard where the limbs of the trees come close together, you cannot get it to grow under the trees, but you can get a little growth, and in that case I would use those crops which seem to make the best growth in the shade.

Mr. Bingham: Would you recommend something in the line of turnips in an orchard of that size, from the fact that they would be better to get into the ground next spring? Or, in other words, how would you recommend getting in a heavy crop of oats, what tools would you use in working them in?

Prof. Moore: I would use the disk harrow. I think you would find, by the time it is ready for spring cultivation, that with a disk harrow you can work the oats in pretty well.

Mr. Bingham: You would have considerable difficulty in ridging the orchard.

Prof. Moore: Not necessarily; with the disk, of course, you have to work the orchard in two directions, and in that way keep from ridging it. I have seen a disk harrow this summer in an orchard which had been neglected, with a crop of weeds up to here (indicating); I saw the man who has charge of that, one of our students; he has a disk harrow in there and he is working those weeds into the soil; mowed them off first, put the disk harrow on them and is working them into the soil, and that orchard was at first so rough that he could hardly go through with the spraying machine without breaking down, yet he is working those weeds in and he is getting that orchard into shape.

Mr. Bingham: What kind of disk harrow would you use, the cut-away, or the other kind?

Prof. Moore: The cut-away harrow seems to be better for the work which I mentioned. He had a cut-away harrow.

Mr. Bingham: Does it not cut off some roots?

Prof. Moore: No, not if you have given your orchard proper cultivation from the start. Of course, if you have not cultivated it, and left the roots at the surface, you would cut off the roots, just as if you would cultivate your corn later in the season, you would injure the roots.

Mr. Toole: I would like to ask in what way rutabagas would add phosphorus to the soil?

Prof. Moore: I did not mean to add phosphorus. You understand the plant foods are in two conditions, either available or not available. There is a great deal of phosphorus in the soil which the fruit tree cannot use directly, but when that is taken up by the turnip or rutabaga and stored in the roots, when it is taken up and transferred, then you plow that down into the soil, work it into the soil, then your phosphorus is in the condition that the trees use it.

Mr. Richardson: Did you ever put a cover crop on strawberries?

Prof. Moore: No, we put a mulch on strawberries late in the season, but not a cover crop. We like to cultivate the strawberries and keep them growing quite late in the season.

Mr. Richardson: Are there not certain seasons when a cover crop would be helpful, when it is very wet in the fall and has been dry in the summer, when you get a late fall strawberry

growth that you are afraid they will not go through the winter?

Prof. Moore: In that case, for instance this season, you put on a cover crop at present for checking the growth; at the same time the great trouble of putting it on at this time of the year is that you will be unable to get it under in the spring, unless you get a mulch and bury it.

Mr. Richardson: Suppose you put on a cover crop.

Prof Moore: Take for instance sugar beets, sow them along about this season and then put on your mulch and then work them under next season, is that what you mean?

Mr. Richardson: Would you work them down in the spring?

Prof. Moore: No, work them in after your crop is harvested; that would add available nitrogen. That would have a tendency to give you a good growth. Only it might do this; it might force your plants into growth so early that it would lessen the crop next year. Not lessen it in the way of setting fruits, but from the fact that a great many strawberry plants throw out runners at the time of fruiting if they have lots of nitrogen; the tendency would be to throw them into vegetative growth and make the berry smaller. There would be the difficulty.

BEST VARIETIES OF APPLES FOR COMMERCIAL ORCHARDS.

The President: I see the speakers are to be selected by the presiding officer. I will call on Mr. Hatch to give us a list of the best varieties for commercial orcharding.

Mr. Hatch: I could not do it. I have talked a great deal of orcharding all my life, and now I will say I do not know what I would plant; it just depends on circumstances. There are a great many things I can make money out of; I do not know that there are any three that I prefer to plant in preference to any other three, it would depend on what I wanted to accomplish when I planted, for what kind of a market. I refuse to name three varieties for anybody, because they might suit them and might not.

The President: It is not confined to three.

Mr. Hatch: If a man likes the Snow apple, he can take it and

make money out of it, if he knows how to treat it. He can take the McMahon, Lubsk Queen, or it might be half a dozen other varieties, it depends on the man. Nine-tenths of any orchard is the man, and the other tenth is what he has to do with. Every man is a problem to himself, individually, and the whole situation. I do not like to say anything further in regard to that matter.

Mr. Riegel: May I ask Mr. Hatch what he has planted?

Mr. Hatch: I have very litt'e orchard here myself; I have only about two hundred trees; I do not care for the orchard, Mr. Bingham attends to that, he is a younger man. When I came here I did not care to go into the fruit business; he can tell you more about it, because he is doing these things. I have planted a number of varieties; I might or might not plant them again, according to circumstances.

The President: Mr. Bingham.

Mr. Bingham: I think a great deal as Mr. Hatch does, it is a hard matter to name varieties for any one to make money out of, it all depends on what purpose he has got. If he handles it right, there are a number of varieties that do very well. I will say, in my own orchard we are growing largely Northwestrn Greening, McMahon, Wealthy and Snow. We have others, but those are our principal crop, and by handling them right we get good apples every year, and we use the system of cultivating the entire season, that is, up to the first of July, and those four varieties are good for me, knowing how to handle them and being familiar with them for a number of years.

Mr. Buehler: I think it depends a great deal on the locality in which you live. For instance, I would not recommend a person to grow the same apples that grow down in Illinois, or the northern part of the state, perhaps, where they would not do as well as with me, and perhaps the market conditions would have something to do with it. I think it is best for each one to choose the commercial apples that are paying best wherever he lives.

Mr. Riegel: Mr. Buehler is not definite enough. We know where he lives, but what varieties does he plant?

Mr. Buehler: McMahon, Wealthy and Snow are my best paying varieties.

Mr. Hilderman: I would like to ask if any one knows anything about the Peerless apple?

The Secretary: We have the Peerless apple in the Wausau trial orchard; twelve trees have been planted for eleven years;

they fruited for the first time last fall, gave us a good crop of fruit, the trees were quite well loaded with fairly good apples; no fruit this year. It is an apple of about the season of the Wealthy, not as good in quality, not as good in appearance, and judging from the Peerless trees in the Wausau orchard, I can see no place for it in our orchards. It is not as good as the Wealthy.

Mr. Bingham: I think the fact that the trees in the Wausau orchard have borne but one crop in twelve years should condemn the variety right away. I think a variety that does not produce more fruit than that should not be planted in a commercial orchard.

Mr. Hilderman: How is the Milwaukee?

The President: The Milwaukee has a little local reputation, that is all. It never has been propagated very much; never has been found worthy.

Mr. Hatch: It is a Duchess seedling.

The President: Yes, and it is not hardy outside of its own neighborhood.

Mr. Toole: In Sauk county a great many apples have been raised and shipped and money made by raising and selling them, and there are several varieties that pay well there. The Duchess perhaps brought more money and paid better because it has been yielding good crops for a great length of time. I think at present we would set the Wealthy ahead of any other variety, but I notice the Duchess pay and continue to pay. And following them, the Northwestern Greening is promising, although it is somewhat uncertain, I do not know whether it will always continue in favor, but the Northwestern Greening has been paying and promises to for some time, and the Newell has paid well with us, and Plumb's Cider has paid well, and there are some people who think Patten's Greening will be standard on the list of paying varieties, although we may quarrel with the quality. One of the Palmer Brothers said he has made a great deal of money in the past from the Golden Russett, but still, we do not generally plant it much although it has made money. I think that list can be extended with us for paying varieties.

Mr. Buehler: I think in planting commercial orchards we should plant large, red apples. A white apple never takes the market as the red apple does. I would not plant Talman's Sweet or Patten's Greening.

Mr. Toole: I have heard different people say that the McMahon was a poor apple, yet people will buy it on sight.

The President: That is not a red apple, either. I told him he would have a fight on his hands.

The Secretary: I want to ask the fruit men of the state if it is not a fact that we should plant exclusively fall apples in our commercial orchards, exclusively summer and fall apples? It so appears to me from my limited observation. In the first place, we have few, if any, good winter apples. I think the best one we can set up is the Northwestern Greening, and the East or South can grow a dozen or fifteen that are as good, if not better than the Northwestern Greening. But there is no section in the United States that I know of that can produce fall apples of the quality of the Wealthy and the McMahon and others of that class, the Snow apple, and do it as well as we can do it in Wisconsin. It has seemed to me for years that the opportunity for the orchardist in Wisconsin is to grow summer and fall apples. The eastern and southern regions are not growing these and will not grow them when they can grow Baldwins and Ben Davis, perhaps, and other late keeping apples. There is no tendency on the part of the orchardists in the large orchard sections of the United States to plant the fall apples, and it appears to me that it is our golden opportunity to raise apples that can be marketed in October and November; get our beautiful Wealthy apples on to the market before the wormy Baldwins come from Michigan and before the winter pack comes from the eastern states. Just at that time the markets are bare in Chicago, and the northwest, in Minneapolis and Omaha, and we have the demand and we have the men, why not plant the Wealthy apple? Why not plant the Mc Mahon, why not plant the Fameuse and others of that class, and why not plant liberally of Duchess? Just the moment when somebody will come forward and give us cheap and rational storage for the Duchess, by which we can hold it three weeks or a month after picking, then we will add the Duchess to that list, and even now as it is, without storage, there is just as much, if not more money made out of the Duchess apple grown in Wisconsin than any other apple that we grow, acre for acre. I shall continue to say until I am well convinced to the contrary, that I believe the opening, the opportunity, for apple culture in Wisconsin lies along growing summer and fall apples exclusively, because there is the market for them.

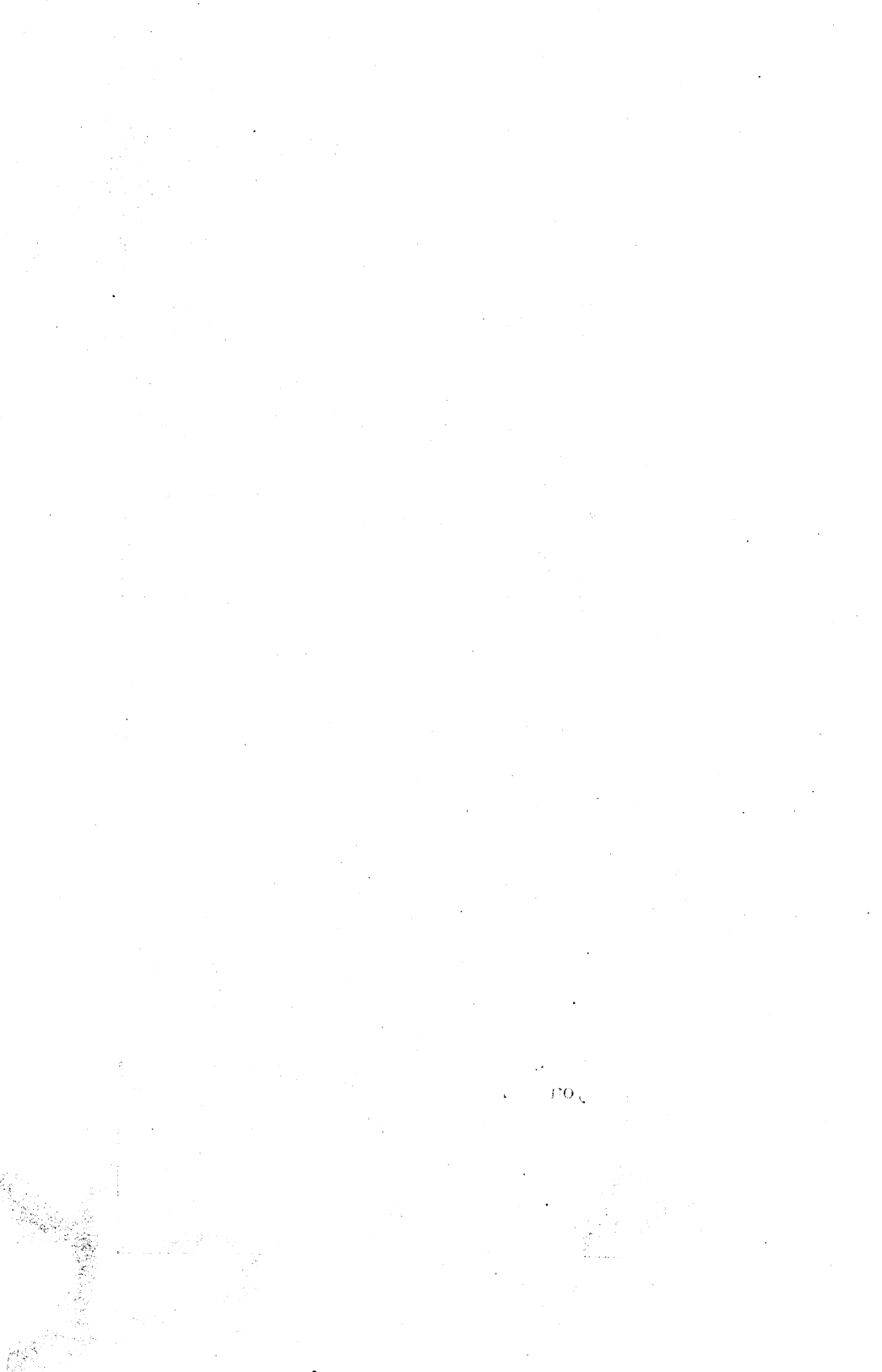
Mr. Richardson: I would like to ask our secretary if he would add the Yellow Transparent and Tetofsky to that list as available?

The Secretary: Why, yes; those are summer apples; I would class the Duchess and Wealthy and McMahon as fall apples, there is always a market for the Transparent; we all know its reputation as a blighter, but there are sections where the Transparent does not blight.

Mrs. Treleaven: I would like to ask the secretary if he thinks it pays to grow Duchess apples and take the choice apples to the market and sell them for 25 cents a bushel?

The Secretary: There are two things to be considered, whether it is in producing apples or any other crop, for that matter. One is in growing it, the other is in selling it. Now, we have to combine those two things, no matter how many apples you raise, if you cannot sell them, if you have not the skill in marketing them, your efforts will be in vain. I know how it is about the Duchess in the local market, I know how it is in Wausau, which is perhaps a case similar to the one mentioned. There are a great many Duchess trees in small lots in the vicinity of Wausau and as soon as the apples ripen they will bring them in and peddle them around. As a consequence, the price goes down to twenty-five cents a bushel. That is not the way I would have you raise Duchess apples. I would want you to have a thousand trees and pack them in barrels and ship to the markets that are waiting for them. There are two kinds of orchards, the farmer's orchard and the commercial orchard. We cannot very well combine the two. With the farmer's orchard, we may have to depend exclusively on the local market and that, I admit, is almost always glutted, but when you grow them in large enough quantities so that you can barrel them or a buyer buy them on the tree and give you a fair price for them on the tree, then there is as much money to be made as in growing winter apples. Mr. Toole can give you an idea in regard to marketing the Duchess apple, I think he can tell you that they are growing and selling them around Baraboo for a better price than twenty-five cents a bushel.

Mr. Toole: I would like to say that I think the Duchess is a very important apple to this state and to the northwest generally, and I believe in our section of the country a great mistake is made in picking it too quickly. The same with the Wealthy,



A row of iris.

Perennial phlox.

and it would pay to take at least two pickings, in preference to clearing the tree all at once. Make one picking, then what is left on the tree will increase in size and beauty. In regard to the Duchess and these early apples, we find now that they can be raised anywhere, that is, with suitable selection of site. In regard to the Transparent, it blights so badly with us that we have to leave it to the northern part of the state, where it seems not so subject to blight as with us.

A Lady: I wish to ask why Wisconsin does not box its apples as they do in Washington?

The Secretary: It costs too much.

Prof. Moore: Owing to the fact that it costs more for the Washington fruit grower to produce his crop and to place it on the more distant markets, his fruit has to make a better appearance in order to bring remunerative prices, therefore he has to use the utmost care in packing. The Wisconsin grower must take less for his product and therefore cannot expend so much in placing it on the market. There may be a small quantity of fruit which it might pay the grower to pack as the Washington grower packs his, but the greater portion of fruit packing by this method would be a loss to the extent in which the expense would exceed the ordinary method now used.

A Lady: I understand Washington apples pass by Wisconsin into the eastern markets and are considered much better, if not in quality, yet in appearance, and appearance sells a great many apples. I do not think they taste any better. If Wisconsin apples were done up in paper the same as oranges, they would look nicer and I think would sell better.

The President: The fact is, in order to put apples in boxes and get topnotch prices, they must be extra fine apples.

Mr. Buehler: I tried to put Tetofskys in bushel boxes this year and part of them in barrels. I received $1.05 per box and $3.50 for the barrels and it was much more work to pack in boxes than into barrels and more expensive.

BEDDING PLANTS—THEIR USE AND ABUSE.

WM. G. MACLEAN, Foreman of Parks, Madison.

Alhough nearly every one knows what is meant by the term, bedding plants, it may be well to mention, all the spring flower-

ing bulbs, geraniums, coleus, pansies, etc., as some of the more common. Bedding plants are very appropriately used in connection with buildings, formal drives and parks.

In connection with statuary there seems to be nothing else so well suited as bedding plants, because they add color to a scene that would otherwise seem dull.

Those plants afford opportunity for beautiful effects in formal gardening, but this is apt to be carried to extremes and thus excite the disgust which it merits.

There is one place where bedding plants are most inappropriate, and that is in naturalistic landscape compositions of all sorts. We see nothing so formal in nature pictures. The lines and colors in an agreeable landscape should be harmonious, this harmony and blending is generally lost where bedding plants are employed.

Another abuse of bedding plants is, the fantastic and eccentric shapes, such as carpet beds, butterflies, gates ajar, etc. Why use such precious things as flowers to make, at best, but a poor imitation of something? In designing the beds, let us be governed by simplicity, the simpler the forms, the better, and let the flowers attest their own merits.

Let us not overlook the importance of harmony in color. We have all seen beds, so mixed in color, that the general effect was more like a crazy quilt, than anything else. Remember that colors that would look bad in a carpet, a rug, a wall paper or a painting, are usually bad when combined in plants. Colors are usually stronger in plants, and this is allowable. When I see a building surrounded by spacious grounds, and what would otherwise be a beautiful lawn, but unfortunately dotted all over with little beds of every shape and color, it reminds me of the definition I once heard of the word weed.

The old gardener, (after acknowledging that a weed was an undesirable plant) illustrated still farther by saying, that if a lettuce plant were to come up in the lawn, the lettuce would be the weed, and that if the Kentucky blue grass were to become established in the lettuce bed, the blue grass would be the weed. Perhaps it isn't right to call these plants, in these out-of-place beds, weeds, but one thing is sure, they are very undesirable.

The growing, setting out, and maintenance of bedding plants, make them expensive, and then one must take into consideration the short time which they last. In Wisconsin, tender bedding

plants cannot be planted out until the 10th of June, and in September they are often stripped of their beauty by early frosts.

Before planting we should have a definite object in view. If there is no reason for planting, then do not plant, Bedding plants are usually employed to add color to the scene. Color enhances the beauty of formal design, and so we will always appreciate the merits of bedding plants, properly used, because they add permanent color and pleasing design, to scenes that would otherwise seem dull and unattractive.

HORTICULTURE IN TEXAS AND WISCONSIN.

By A. C. HATCH, Sturgeon Bay.

What I say of Texas horticulture I wish to limit to the so-called "Gulf Coast" country. Texas is so vast a state and has so many different conditions within its border that what is true of one region may not apply to any other. This "Gulf Coast" region is being exploited for winter gardening and semi-tropic fruits. It lies in the extreme southern part of Texas, from Corpus Christi to Mexico. Hundreds of artesian wells with fine pure soft water with a temperature of 85 to 95 degrees are now in use for irrigation over a large share of this country. The soil is made up of the silt washed down and deposited by the streams flowing from the higher country to the northward, through untold ages. These soils vary with the character of material washed down from the higher regions, and may be sand, marl, gummy black soil or more porous alluvial, much of which seems to be very fertile and ideal for gardening, and when properly selected, finely adapted for fruits.

From the standpoint of a northern man this country is very interesting, very alluring and very puzzling. Throbbing and thrilling with energy from the north it is being improved and developed along a multitude of lines that is a source of wonder and astonishment. I will pass this feature by with the observation that much of this development is based upon hope and however promising the future may seem a large share of the natives owning property were ready to sell.

Perhaps some of the strangest features of this region is its marked contrasts in climate that cannot be judged correctly from northern experiences. That drought should be the cause of erosions or washouts along the banks of streams, that it should be the cause of ponds of water and great ditches through the land as well, is very puzzling indeed, while another peculiarity is the fact that its frosts are all imported with north winds. It may have a year's drought or a flood along the Rio Grande that may cover 20 to 50 per cent of the country. It may have fine winter weather when tender vegetation is not killed or it may smite with a frost to destroy all garden vegetation and kill all fruit trees to the ground. While this is called a semi-arid country it may have sufficient rain to grow cotton and sugar cane. On Christmas day you may pick fine roses in great variety from the open ground, you may see climbing vines and hot house plants in the parks, lawns and gardens, yet, if you go into a florist's shop you may learn the astonishing fact that the roses and carnations he sells are grown in Chicago. You may see beautiful fields of Bermuda onions grown on irrigated and perfectly cultivated land destroyed with an almost invisible insect foe. You may see beautiful fields of corn fully grown with corn retailing at 70c a bushel and yet never harvested. You may see wonderful growths on trees and plants, figs particularly bearing abundantly the first year.

Laying as it does between southern California and Florida this country is trying to rival them both in the production of citrus and semi-tropic fruits. For its soil and climate, it will need probably varieties and methods not entirely similar. In Florida, for instance, oranges are cultivated in the winter only, while California cultivates them in the summer only. In California the government maintains about a dozen exerimental vineyards to help solve some of the difficulties grape growers have to contend with. Perhaps one of the greatest difficulties is to secure dormancy during winter. When grown from cuttings upon their own roots the vines of what we know as California grapes are liable to grow considerably during the winter months when a light freeze is apt to prove very hurtful. To secure this dormant condition various kinds of southern grapes are used as stocks upon which to graft rasin and other grapes. The Texans have a native variety that does not grow in the winter that it is expected will accomplish this purpose. It has been found that besides this

dormant condition it is necessary to have roots that will resist the attacks of the gall louse and also thrive on lime soils. Then when these have been overcome it is just as essential to protect from insects and fungus diseases as it is here. A very interesting method of propagation is practiced. A single bud of the desired kind is doweled with a bit of wire upon a cutting of wild vine and the cutting thus grafted is planted.

In citrus fruits it is hoped to secure this winter rest by budding the Tangarine and Mandarin type of orange upon a common sour orange called *trifoliata* that is itself dormant during winter. In peaches it is hoped to secure what is adapted to the country from the south Chinese peaches of which the Elberta is a hybrid or cross, for it has been found that Persian peaches that thrive further north are not adapted to that climate.

That the strawberry can be profitably grown had not been demonstrated. Plants set in December bore some fruit the first of March just as plants set here in April might bear in July. A fair set of plants might be secured possibly from plants set in September but that such plants would stand summer heat is another question. It seems that it is the practice to plant windbreaks of castor beans, tamarisk, encaluptus and other things to protect orange and other trees and it is likely if strawberries are carried successfully through the windy season of spring and the heat of summer they would need to be protected with a shade and wind break of sorghum or something of that sort. With the retail price from 25 to 40c per quart we of Wisconsin would think there would be money in strawberry growing unless the difficulties of production are too great as they may be.

Perhaps it will help to realize some of these difficulties if we consider insect life there. While much of it is dormant during winter a few sorts were very active, notably two kinds of ants. One, a little chap about an eighth of an inch long that seemed to be everywhere present and very hungry for meat, butter, grease, and food generally, so that it was necessary to place the legs of dining tables, cupboards, etc., in dishes of water or kerosene to prevent them from taking possession. If the table happens to touch the wall or even a corner of the table cloth touched a chair it would make sufficient bridge for the little mites to get into the food much to the wrath of the cook. When you attempt to get them off you'll think they bite but they don't, they sting just as a bee does. I learned of a larger kind that stings much more se-

verely than a bee or wasp does. The kind of ant that is of more interest to fruit growers is the cut ant—a good sized chap that has a big black head. His business seemed to be to cut pieces out of the leaves of peaches, oleanders, etc. and carry them into holes in the ground. So numerous and industrious are these little fellows that they will often entirely defoliate a tree and carry the leaves into the ground perhaps thirty feet away, making a very distinct trail all the way. Another insect abundant in the whole country where trees and brush grow is a species of weevil or snout beetle. As most of the trees and shrubs bear beans quite profusely they seem to have plenty of food for their depredation, and they are ready to infest all grain, etc., the country may produce. That they would infest fruits is not certain but I should not like them for bed fellows at any rate.

In all this region I saw very few plants of any kind that I ever saw before. Where the same species exists that we have in the north it usually is a different variety and while very interesting and some of it exceedingly beautiful much to be seen is not at all pleasing. Indeed, much of the vegetation is extremely ugly. Trees, shrubs and plants loaded with thorns, spines, briers, and prickers, or dwarfed, stunted, dying or dead with parasites, gray and ashen in color are certainly not the most cheerful things to put in a landscape. Even in the parks of the larger cities one of the chief attractions is the great quantities of Spanish moss festooned in profusion from the branches of its giant live oaks and pecan trees.

One more feature of this sunny south I wish to note, and that is the absence of grass as we have it in the north. When lawns are attempted the grass is planted and not grown from seed. There is what appears to be grass, probably is grass, but we don't call it grass in Wisconsin. In wandering around one day I found a nice field of it and being weary I sat down to rest but got up very quickly as I found I needed half-soles on my pants, as the stuff was good old-fashioned sand burs. They have a sort of grass that is similar to quack grass but the roots are from ¼ to ½ of an inch in diameter as I saw it growing. Oklahoma has outlawed this grass although it is grown some in Texas for hay just as they grow sorghum and kafir corn, one acre of which will easily feed a cow as several crops can be cut from one planting.

Perhaps one of the greatest contrasts that fruit growers of the north can appreciate is the keeping properties of fruits and vege-

tables. During summer and nearly all winter everything soon gets stale or over ripe. In the culinary line not much can be done in saving food supplies and new supplies are secured from day to day so that the people literally live from "hand to mouth."

While it is possible to grow a large variety of fruit in the south much of it lacks quality to make it so extremely valuable and after all with our longer seasons for some fruits and its keeping qualities considered we of Wisconsin can get just as much and more comfort out of our products than they can in the "sunny south." While we complain of our severe cold winters they really are a source of blessing to us that gives us dormancy and rest for our trees, plants and vines, and a reasonable assurance of crops every season.

For beauty of landscape as affected by vegetation, in grace and splendor of forms, in richness of coloring of foliage, especially in autumn over the hills of southern Wisconsin I have seen nothing in all the south so pleasing and satisfactory. I may go still further and say that in the beds of shrubbery growing upon the campus of our own State University at Madison and along its driveways I have seen more inspiring loveliness of form, foliage, fruit, and color than I ever saw elsewhere. And when I learned that during fifteen years about a thousand citizens of Madison had been planting more than 40,000 trees and shrubs along the driveways and in the parks and making improvements worth thousands of dollars by voluntary contributions I felt proud that such public spirit exists in our own state.

When we read of fruit farms in the south or far west selling at such fabulous sums we may feel as though Wisconsin is not in it at all. As far as I know, however, especially in the south they have the same difficulties to contend with that we do here and often more difficulties and greatly intensified at that. When done with faith and good sense and energy we need not despair of good returns, and indeed we need not blush in making comparisons. When land right here in Sturgeon Bay is earning a net sum per acre and has been doing it for several years to pay the interest on more than $2,000.00 at 7%, surely we need not complain. If these facts are appreciated at their full value and acted upon there will be no more occasion to go to other lands to secure the blessings of life in fullest measure.

REPORT OF COMMITTEE ON AWARDS.

Summer Meeting.

Branching Asters: 1st Mrs. A. L. Hatch; 2nd Mrs. L. W. Barnes.
Dwarf Asters: 1st Mrs. D. D. Howlett; 2nd Kilian Simon.
Single Dahlias: 1st Mrs. L. W. Barnes; 2nd Mrs. D. D. Howlett.
Double or Show Dahlias: 1st Mrs. L. W. Barnes; 2nd Mrs. D. D. Howlett.
Blazing Star Liatris: 1st E. S. Hildemann.
Perennial Phlox: 1st Mrs. L. W. Barnes; 2nd Mrs. D. D Howlett.
Gladioli: 1st Mallory & Bridge; 2nd Mrs. L. W. Barnes.
Pansies: 1st Mrs. L. W. Barnes; 2nd Mrs. A. L. Hatch.
Stocks: 1st Mrs. L. W. Barnes.
Sweet Peas: 1st Mrs. A. L. Hatch; 2nd Mrs. L. W. Barnes.
Single Petunias: 1st Mrs. L. W. Barnes; 2nd Mrs. D. D. Howlett.
Double Petunias: 1st Mrs. L. W. Barnes; 2nd Mrs. D. D. Howlett.
Verbenas: 1st Mrs. L. W. Barnes; 2nd Mrs. D. D. Howlett.
Cosmos: 1st Mrs. D. D. Howlett; 2nd Mrs. L. W. Barnes.
Display Annual Garden Flowers: 1st Mrs. L. W. Barnes; 2nd Mrs. D. D. Howlett.
Best Bouquet Garden Flowers: 1st Mrs. L. W. Barnes; 2nd Mrs. D. D. Howlett.
Golden Glow: 1st Mrs. L. W. Barnes; 2nd Mrs. D. D. Howlett.
Marigold: 1st J. Fuerestein.
Achillea: 1st Mrs. D. D. Howlett; 2nd Mrs. L. W. Barnes.
Shasta Daisy: 1st Mrs. D. D. Howlett.
Daisy: 1st Mrs. D. D. Howlett.
Dianthus: 1st Mrs. D. D. Howlett; 2nd Mrs. L. W. Barnes.
Larkspur: 1st Mrs. L. W. Barnes.
Platycodon: 2nd Mrs. L. W. Barnes.
Perennial Pinks: 2nd Mrs. L. W. Barnes.
Rudbeckia Barbaria: 1st Mrs. L. W. Barnes.
Tiger Lily: 1st E. S. Hildemann.

POTTED PLANTS.

Fuchsia: 1st R. T. Bagnall.
Begonia: 1st J. Fuerestein.
Sword Fern: 1st J. Fuerestein.
Asparagus Plumosus: 1st Miss Pauline Johnson.

WILD FLOWERS.

Golden Rod: 1st H. Stephenson; 2nd Mrs. D. D. Howlett.
Asters (native): 1st E. S. Hildemann; 2nd Mrs. D. D. Howlett.
Boquet Wild Flowers: 1st Mrs. D. D. Howlett.
Ornamental wild fruits: Mrs. D. D. Howlett.
Col. wild flowers: Mrs. D. D. Howlett.
Sweepstakes awarded to exhibitor receiving largest number of 1st premiums on flowers and potted plants: Mrs. L. W. Barnes.
Greenhouse Flowers and Plants:
Ferns, (evergreen): Swan & Son.
Palms: Swan & Son.
Greenhouse plants other than palms and ferns: Swan & Son.
Floral Design: Swan & Son.
Roses and Carnations: Swan & Son.

FRUITS.

Yellow Transparent: 1st W. I. Lawrence; 2nd E. S. Hildemann.
Sops of Wine: G. W. Reigle.
Duchess of Oldenburg: 1st E. S. Hildemann; 2nd B. F. Otis.
Barloff: 1st E. S. Hildemann; 2nd D. E. Bingham.
Beautiful Arcade: 1st E. S. Hildemann; 2nd F. W. Cheeseman.
Switzer: 1st John Hanson; 2nd E. S. Hildemann.
Wolf River: 1st J. G. Buehler; 2nd John Hanson.
Wealthy: 1st J. G. Buehler; 2nd W. I. Lawrence.
McMahan: 1st J. G. Buehler; 2nd F. W. Cheeseman.
Fameuse: 1st W. I. Lawrence; 2nd J. G. Buehler.
N. W. Greening: 1st D. E. Bingham; 2nd W. I. Lawrence.
Iowa Beauty: 1st W. I. Lawrence; 2nd D. E. Bingham.
Newell: 1st D. E. Bingham; 2nd J. G. Buehler.
Lubsk Queen: 1st D. E. Bingham; 2nd J. G. Buehler.
Red Astrachan: 1st W. E. Marshall; 2nd W. I. Lawrence.
Alexander: 1st J. G. Buehler; 2nd W. I. Lawrence.
McIntosh, Red: 1st W. I. Lawrence.
Maiden Blush: 1st W. I. Lawrence.
Talman Sweet: 1st W. I. Lawrence; 2nd John Hanson.
Price's Sweet: 1st Mrs. D. D. Howlett.
Gideon: 1st J. G. Buehler; 2nd Mrs. D. D. Howlett.
Haas: 1st J. G. Buehler.
Utter Red: 1st J. G. Buehler.
American Codling: 1st J. G. Buehler.
Tetofsky: 1st W. E. Marshall.
Okabena: 1st J. G. Buehler.
Windsor Chief: 1st J. G. Buehler.

Hawkeye: 1st Wm. Toole.
Baraboo: 1st Wm. Toole.
Beatty: 1st Wm. Toole.
Wolf: 1st Wm. Toole.
Dame Aubert: 1st Wm. Toole.
Early Red: 1st Wm. Toole.
French Damson: 1st Wm. Toole.
Willard: 1st W. I. Lawrence.
Red June: 1st W. I. Lawrence.
De Soto: 1st J. G. Buehler.
Wyant: 1st J. G. Buehler.
Weaver: 1st J. G. Buehler.

CHERRIES.

Red (sour): 1st Mrs. A. L. Hatch; 2nd W. I. Lawrence.
Red Raspberries: 1st Nick Jacob.
Blackberries: 1st Nick Jacob; 2nd A. Birmingham.
Exhibit Forest tree and shrub seeds of commercial value: F. M. Graase.
Exhibit Honey: Klon Beyer.

PEARS.

Bartlett: 1st W. I. Lawrence.
Besnianka: 1st J. G. Buehler.

Transactions of the Winter Meeting

Annual Convention, Madison, January 12, 13, and 14, 1909.

Tuesday Afternoon,—January 12.

The meeting was called to order by President R. J. Coe at 2 p. m.

Prayer by Mr. Irving Smith.

PRESIDENT'S ADDRESS.

R. J. Coe.

Again we have met in annual convention to review the work of the past year, to tell of our successes and failures, to get and to give information, to gain inspiration for our work, and above all, to get a new and larger stock of enthusiasm, for after all is said and done, enthusiasm is the one thing above all others that accomplishes things, it is enthusiasm that spurs us on to undertake and carry through every great work. In fact, it is enthusiasm that does the world's work, and without it no man ever has or ever will make very much of a success of any business in which he may be engaged.

Whatever we have done during the past year, whether of success or failure, is now a matter of history and can only be recorder, not changed.

We have all seen, and probably most of us have helped, (when there was a fall of damp snow) to roll a snowball and have seen that at first it was very small, grew very slowly and did not take up much snow, but as it was rolled over and over, it took up more and more with each revolution, until at last a single revolution did more than the first hundred. The growth and influence of our

society may very well be compared to this snowball. It struggled along for a number of years without making very much of a stir in the world and its circle of influence was not very great, but it has been growing and growing, until now it is gaining as much in influence and usefulness in a single year as it did in ten or twenty during the early years of its life.

The question may be asked, "What is the Wisconsin Horticultural Society doing to earn the reputation it is getting as being one of the foremost, if not the very foremost, of state societies?" It is doing just the things that the people need. It has established and is maintaining at the present time nine trial orchards and two more located well distributed over the state, each one for a definite purpose; those in the north largely experimental as to varieties to demonstrate what varieties of tree fruits, if any, can be successfully grown. Those farther south, with a few varieties to try to show that commercial orcharding can be made a profitable business venture. At Sparta, that great small fruit center, an acre of grapes has been planted for trial and it is hoped that this will prove a success and I can see no reason why it should not. If so, it will extend the length of the fruit season and add very materially to the incomes of the fruit growers of that section.

I believe the time has now come when we should broaden our field of labor and do something along the line of ornamental planting, something that will show us what to plant and how to arrange the planting for best effect. The time was when the home was confined to the four sides of the house, but that time has gone, never to return.

As the people are living more and more out of doors, the grounds surrounding the house are as much a part of the home as is the house itself. The decoration of the home grounds is an art of itself, not well understood by the most of us, and if we can have a goodly number of object lessons of this kind scattered throughout the state, it would be a wonderful help to all in those sections in the planting of and beautifying the home grounds. I believe flowers and plants have a refining influence on our lives, and if we can have plenty of them, our homes will be better and happier for the having.

I want my own home (and I know you all feel the same way about your own homes) to be such that when the children come

to leave it, they may look back to the old home as the dearest, sweetest spot on earth.

I think our secretary has in mind some plans for providing these object lessons, and if he has, let us give him all the encouragement and help we possibly can.

I think it is entirely within the province of this society to encourage the planting of trees other than fruit trees. Wisconsin has urgent need of an army of tree planters. It is probably safe to say that a thousand large trees are cut for every small one that is planted. It only needs a little mathematics to show us where we will land in the near future if the present rate of destruction is kept up without some provision being made to keep up the supply. Then, too, the bulletins that have been issued at frequent intervals have been the means of disseminating a vast deal of valuable information. Take, for instance, the seedless apple fakirs that would now be taking thousands of dollars from our state if they had not been so thoroughly shown up in our reports and by a special bulletin. They found Wisconsin too warm a state to live comfortably in and have moved on.

And there is the man who claims to be sent out by this society to teach the farmers how to prune their orchards, and then in order to pay expenses had to sell a bill of nursery stock, "from Ohio." He also found the Wisconsin climate a little too warm for his health; see bulletin No. 14.

The contract orchard men have also received a share of our attention, and if they have not already departed from our inhospitable shores, will undoubtedly soon do so.

Of course it is our secretary who has borne the brunt of the battle and done all the work, but he has had the horticultural society to stand back of him and to hold up his hands in the good fight, and with this moral support he has been enabled to accomplish vastly more than he could single handed. You see we are perfectly willing to let our secretary do the fighting and we take the credit.

SMALL FRUIT SESSION.

The President: A horticultural meeting would hardly be a true horticultural meeting unless we had some strawberries mixed

in, and I see our secretary has recognized this fact by placing the subject on our program for the first session, and the first paper is to be by Mr. George J. Kellogg.

STRAWBERRIES FOR 1908.

By GEO. J. KELLOGG, Lake Mills.

Notes on New Varieties.

"Outlander" 4 oz. for one berry reported to me when I was in Washington D. C., by Col. Brackett, weighed by him so there can be no mistake of its size; but the question is how was it grown—probably one berry to a plant? This would only do for the amateur.

Then the Pride of Michigan reported from Milwaukee at our last winter's meeting, *"four to a quart;"* this we doubted and wrote to the grower and found it was *"five to a pint."* Well this was pretty good but they were grown by one who is an expert and by the free use of commercial fertilizers. We have it in just good garden culture and will know how it does alongside other known varieties.

What we want is a berry that needs to be quartered, as good as the wild berry, that will stand any abuse, fight the insects, beat the blight, scab and fungus diseases, winter without mulch, not affected by dry rot or winter root killing or frost and bear at the rate of 800 bushels to the acre. This is only five bushels to the square rod and that is what the old Wilson did in Janesville.

Who knows but the "Norwood" will do it, or the "Fendall," the "Highland" or the "Bountiful," *Highland, the best of 146 Varieties, Ohio Station."*

When I visited Prof. Van Deman in Virginia, he said "Pan-America" was the only ever-bearing variety that he thought worthy propagating. I planted that the 30th of last April and with it "Autumn." I bought them to test their productiveness, let them go right at it; they commenced to bear as soon as they got started to grow and every layer bore until the latter part of the season. The Pan-America put out but few runners. The Autumn gave a goodly number, the old plants and the early layers bore from June till December. Sept. 22nd I dug a layer of Autumn that had 118 berries, buds and blossoms, which I potted

and showed at Jefferson county fair and Sept. 29th I dug another from the same row and took to Beaver Dam that had 58 berries, buds and blossoms; the fruit of both kinds is fair size considering the great quantities it bore, good quality and firm. I measured fruit three inches in circumference; they both went under winter mulch full of fruit, except the late set runners. How they will winter I can't say. I hardly look for a pick of ripe berries when I take off the mulch. What I fear is that neither of them will grow plants fast enough; they certainly will not if allowed to fruit.

Now we want to know what any of you have learned the past season that is of real benefit; have you solved the root rot, the drouth and ice winter killing? By last winter's report you can prove black is white and white is black. I believe a dry fall and an open winter does the killing. A friend of mine in Illinois who has acres in fruit, is troubled with white grub on new plantings where the ground has been well cultivated for years. Friend Richardson, I believe, can plant on June sod and have no trouble. How many are spraying for blight, scab and insects? Has any one a better variety than Dunlap? Has any one an early berry that is satisfactory and what is the best late variety?

The President: This paper is now open for discussion.

A Member: How will the increased size probably affect the quality of the fruit?

Mr. Kellogg: The larger berries are of good quality, but I do not think any of our big berries are as good as the wild berry.

Mr. C. L. Richardson: Tell us in some way, comparing with standard varieties, the running propensities of the Autumn and Pan-American, so that we can get some idea as to how they compare with well known varieties.

Mr. Kellogg: The Autumn I should think gave about ten plants to one plant set in the spring, while the Pan-American did not give three plants. I let it go right to fruit, I wanted to see the fruit. If I had kept off the blossoms, as we should do from new plantings, the Autumn would have made a fair plantation of new plants, while the Pan-American would have made but very few.

Mr. M. S. Kellogg: I can give a little information as to those two varieties. I set out a few varieties at Janesville; these

were not allowed to bear, and the Pan-American plants made little, if any, increase above the plants set; we have perhaps twice or three times as many plants now as when set; the Autumn has probably given us about fifteen times as many plants as we set out.

A Member: I would like to ask Mr. Kellogg the best yielding and best late variety.

Mr. Kellogg: I do not know of any better, if you come right down to one, than the Dunlap.

The Member—Do you call that a late variety?

Mr. Kellogg: Well, I think the Brandywine is the best late one I have among eighty kinds.

Mr. Richardson: I should like to recommend the Nettie, but the Nettie is a pistillate. If we plant with some late staminate, it is the most satisfactory of anything we have found up to the present time. There is no doubt that the Crescent and the Midnight and Uncle Jim are very good late staminates to plant with it.

Mr. Riehl: Inasmuch as I have charge of an Experiment Station down in Illinois, it might be interesting for me to mention some of the varieties that do well with us. The best early varieties we have of the newer ones is Oakes' Early and Redbird, our very best recent introductions. They are very prolific. Redbird, however, is too soft for shipment, it would be all right for home market and home use. Oakes' Early is firm, dry, medium size. Both are very satisfactory. A good medium variety is Abingdon, that has given splendid results for the last three years. In the way of late varieties, the one just mentioned, the Nettie, has been satisfactory for years, excepting that it must be pollenized with other varieties. That, however, is easily done, the Dunlap will pollenize it very nicely. The Dunlap I regard as one of the best pollenizing varieties on the entire list. It blooms early enough to pollenize the early ones and it blooms long enough to catch the late ones. In the way of late, the Sample almost leads everything. It begins to ripen about mid season and continues very late, perfecting all its fruit when well pollenized. The Hunn is an older variety that does well almost every year. That is also a pistillate and needs to pollenized. However, we have one recent introduction called the Peter, which is strongly staminate and a good pollenizer. That I can highly recommend, it is productive, strong, a vigorous grower, firm and of the very

First Prize Exhibit of Wealthy Apples, at the Wisconsin State Fair, 1908.

largest size. It combines all of the very best market points. I could name over twenty-five or more varieties that I have tested and some of them very good.

Mr. Kellogg: What do you know of the Howland?

Mr. Riehl: The Howland does fairly well with us, but not well enough that we feel like retaining it in our fruiting beds. This shows how local some varieties are in their habits. In recommending varieties, we should always try to recommend something that is not confined to one locality, but that does well all over the country. For this reason the Dunlap almost stands at the head of the entire list of strawberries, as the Concord does with the grape.

Mr. M. S. Kellogg: Do you find the Sample ripens evenly with you, without green tips?

Mr. Riehl: Splendidly, even when it is right down among the litter.

Mr. Hager: The terms "early and late" are relative terms. Before we proceed any further, I should like to have them defined. How much earlier these early varieties, and how much later these late varieties are than some standard sorts.

Mr. Geo. J. Kellogg: I never found any early ones that there was any more than five to fifteen minutes difference, but the late ones will come two weeks later than the main crop.

Mr. Hey: How about the Stevens from Champaign?

Mr. Riehl: We have fruited it and it is a fairly good late variety, but we have other better ones and have dropped it from our list.

Mr. Smith: What do you know of the Miller?

Mr. Riehl: The Miller is a right good berry; it is firm, making it a splendid shipper, having a bright glossy appearance as if it had been varnished, making it stand up well. It is a good yielder.

Mr. C. L. Richardson: Also, if the season at the time of blooming is at all unfavorable, it runs so badly to buttons that it is almost worthless. If the season is all right, it is all right, but after two or three years' experience I gave it up, it ran to buttons so completely.

A Member: I should like to ask if others have had the same trouble that we have had with the Dunlap. We think we are going to have an enormous crop, but all at once the Dunlap has stopped and we had to look to other varieties for berries.

Mr. Hey: We have had the same experience. It seems as if there are lots of blossoms of the Dunlap, but either they are not fertilized, or they do not fertilize themselves, or there is something wrong somewheres; we think we are going to have a first class crop, then we find the berries are all gone. Another berry we had several years ago we thought a great deal of, we lost the plant, we called the "Staples," a dark round berry.

Mr. Riehl: The Staples was introduced some twenty years ago. It is a roundish berry of high quality and it did right well at that time, but we considered others better, the Warfield and Dunlap and those other varieties came in and we dropped it from the list.

Mr. C. L. Richardson: We had the Staples for a long time. We discarded it. I think it is a relative in some way of the Warfield; it is subject to the same difficulties as the Warfield. The roots are too short. You get it in a light or sandy soil and it cannot withstand the drought and it absolutely renders the berry worthless. We were obliged to discard it on that account and also it is such a very dark color that if it gets a little bit old, if you cannot keep it picked up promptly, it has a dark, unpleasant appearance in the crate and your customers will not take it. Now, in regard to the Dunlap, we have had that same difficulty that the gentleman from Illinois spoke of, but if you get your Dunlap spread out thin enough it will help, at least that has been our experience. That is the only thing I can suggest. I know I have never had trouble with the Dunlap where I had them spread out thin enough, but if they overcrowd, then the lowest blossoms fail and the crop ceases in the middle of the season. Get them out so they are four or five inches apart, do not be afraid that they are going to be too thin. If you get vigorous, well rooted plants, they will be all right.

Mr. Sperbeck: I think the Dunlap is one of the best I have planted, but I think they will get too thick if you allow them to run, and I think the soil has a great deal to do with it. The soil that we have is clay or lighter soil, and the Brandywine is one of the best berries with us for a late bearer after the Dunlap are gone.

Mr. Culbertson: I know that a farmer that had quite a large patch of berries had some little insect cut the little stem that supports the blossom and nearly every plant was lost. Is there a remedy?

The President: I take it, it must be some sort of cut worm?

Mr. Culbertson: No, it is the strawberry weevil, the insect looks like curculio on plums or apples, an insect with a long proboscis and it cut the little stem that holds the blossom, no worm.

Mr. Richardson: Burn over your bed, plow up the ground and set clean plants distant from the old plants. That will help.

Mr. Smith: Every year we try an experiment which I can recommend to you as being of interest in the manner of showing what a great diversity of taste there is. We take a dozen or more of common strawberry boxes and number them, then we bring them in and set them on a table and have a key to these numbers and invite different ones to sample those berries, and then at the same time remark on the quality, on the quality alone. Then we average the remarks and from that we decide which is the best quality of berry for that year. Two years ago the Jessie was considered the finest quality berry. It is a luscious berry, but it is rather a shy bearer, so it cannot be generally recommended. Last year the Ridgeway was decided upon as being the finest berry, it does well with us. Then we meet and talk over the different qualities, the prolificness, color and size, and in that way we get a dozen of our fine berries which may do well in our locality, but we find when it is scattered through the State there are other varieties mentioned that do not always do well. Now, in general, all around quality we find the Senator Dunlap, the Lovett and the Miller are three of the best berries with us.

Mr. M. S. Kellogg: Has anybody found a better berry for general market than the Dunlap planted over a wide range of country? It seems to me, with the experience we have had with it that there is none better. The question was brought up whether a perfect variety planted alone would yield as well as a pistillate variety when fertilized. We had a block of Dunlap from which we had the finest berries I ever saw, without any exception, the berries were unusually large, fine quality and yielded probably one third better than our other plantings which had the same care and culture. Of course our crop this year was not a full crop on account of too much moisture at the beginning of the season, the blossoms blighted on some varieties and those that were not strong in pollen did not mature their crop fully, but from our standpoint I should say the Dunlap is fully 20 per cent ahead of anything else we have for a general market crop.

Mr. Hey: How much do you get per square rod?

Mr. Kellogg: This block of Dunlap that we had contained about an acre and a third, and I think, if I am correct in my memory, that we had four pickings from that piece, averaging every other day about 100 to 125 cases, so that they gave considerably over 400 cases to the acre throughout the season.

Mr. Hey: We have heavy clay soil and strawberries usually do well there, but the Dunlap is no comparison with the Warfield; with us, the Warfield is the better of the two.

Mr. Hager: I want to emphasize the fact that was brought out here, and that is, be careful not to let the Dunlap get too thick. I think that is a mistake we all make. I go in with a hoe and cut them out.

Mr. Hey: We practice the double hedge row system and they were rather thin, too thin to suit me.

Mr. Daub: Has any one had experience with the Belle?

Mr. Richardson: I have them; I have not had them long enough to make any satisfactory report, though I doubt if they are going to be as late as reported, not as late as Midnight, Nettie or Uncle Jim.

A Member: Does anybody know anything about the Cardinal?

Mr. Riehl: The Cardinal is one of the nicest looking berries you can imagine, it is attractive, firm, in every way one of the nicest berries you can wish to grow, but when it blooms the blossoms are set out on long thick stems and when it sends them out and a frost comes, it is more likely to be caught and for this reason we are unable to get a satisfactory crop. I cannot recommend it. In every other way, it is splendid.

Mr. Richardson: Get it out in Wisconsin in the open field and it does not seem to do very well. They cannot hold their own with the Dunlap, Warfield, Bederwood and Haverland.

Mr. L. G. Kellogg: We have with us Mr. C. B. Cook as a delegate from the Michigan State Horticultural Society. I take pleasure in moving that Mr. Cook be made an honorary annual member of the Society and invited to participate in the discussions of the meeting.

Motion put to vote and carried.

The President: We are glad to welcome Mr. Cook to our Society, and you who have the program will notice that Mr. Cook is on the program for a paper on "Fertilizers for Small Fruits."

FERTILIZERS FOR SMALL FRUITS.

C. B. COOK, Owosso, Mich.

The best methods of soil building are uppermost in the minds of every student farmer. No one subject that we can consider is more vital to the lives and success of every American Citizen. Productive lands, well maintained and carefully presided over by intelligent and skillful caretakers become the greatest asset of a commonwealth.

In the north central states the subject of soil building has never become paramount; for the soil is naturally enduring and productive and our problem—as we have seen it—has been to maintain rather than to build a better foundation for farm life. Incidentally chemical research in our section, through the short sightedness of many of our better farmers has helped to postpone general activity in this line. From the fact that most of our soils by analysis show plant food content sufficient to last for a thousand years of continual cropping has helped us to arrive at an erroneous conclusion—namely that the best soil management was a remote problem and well enough left to generations yet to come. We have too often lost sight of the fact that this great store of soil fertility has been mostly locked up in insoluble forms by a master hand and so preserved in reasonable proportions for countless generations yet to come, and hence the man who resolves to overdraw his deposit at the cost of others that come after him soon comes up against a divine law that says most emphatically "Thus far shalt thou go and no farther." While misuse and reckless cropping result in a rapid degeneration of any normal soil, the reverse method, we are happy to say, when thoroughly and timely applied is also followed by most encouraging results.

Soil management for the fruit crop requires greater care and closer oversight than do other farm crops. Small fruits and especially those of a viney nature are easily thrown out of balance by improper fertilizing.

The possibilities of the small fruit area under ideal conditions is almost limitless. No one element has any more to do with the success of this venture than does a thoroughly congenial soil.

The elements that go to make a given soil thoroughly adapted to the best use of the fruit area are manifold. In this connection we can eliminate all but those forces that directly effect the congeniality of a given soil for the fruit crop and those food elements that must be included. Considerable experience in this line under greatly varied conditions leads me to emphasize the local phase of this subject. We can get many suggestions by studying other successful fruit plant feeders but after all in the final we must work everything over and suit our own peculiar conditions. Even on the small farm a variety of soils makes experimental work in several places vitally essential if we would get the best out of the small fruit area.

That system of soil building is only most profitable when it is so conducted as to give us the greatest amount of net value from a given area. We are just waking up to the possibilities in this line, and only by the occasional masterful results secured by some close student of his own conditions can we get an adequate idea of the limitations of this subject.

In a general way we must have a soil provided with enough humus or vegetable matter to make its mechanical condition perfect but not overdone in this line. The last state is often worse than the first. Closely connected with this vital supply of vegetable elements is a sufficient amount of nitrogen to run the fruit plants to their highest degree of fruiting excellence. To do this requires close observations in all lines to guard against an overgrowth of vines at the expense of fruit buds. Too much nitrogen is likely to throw the fruit plant out of balance and so produce an excessive amount of spindling foliage with a corresponding decrease of fruiting impetus, usually made evident by imperfect crowns, poorly developed fruit stems, and often few and unsatisfactory blossoms.

On most farms where a short rotation is employed with clover as a leader, and considerable humus and nitrogen furnished by the product of the stable, sufficient nitrogen and vegetable matter can be supplied on the farm for the best results.

Thus we have supplied at nominal expense the most expensive element needed in fruit growing. The other vital elements may still be lacking in sufficient amount to give the fruits enough mineral matter to thoroughly balance and supplement the elements mentioned. In the fruit field we must consider clover and stable manure as a one-sided element of fertility likely to fur-

nish too much vine producing food with comparatively little phosphoric acid and potash. In the case of the soil not having liberal quantities of the latter mentioned elements naturally supplied a liberal dressing of stable manure may be worse than no fertilizing at all. In order to determine the amount of available phosphoric acid in the soil it is well to experiment in a small way with those foods to prove the soils. Over a greater part of the clays of the north central states phosphoric acid can be profitably applied in greater or less quantities depending on the personal equation of the soil in hand. Occasionally heavy application of this element bring returns greatly out of proportion to its cost. On the lighter sands and gravels often potash also, will be needed to bring out the full benefit of the other elements present and keep the plants in balance.

To use these elements separately and in combination in experimental ways on small plats with ample space left for checks where no minerals are used, every fruit grower can soon determine for himself, just the limitations of these elements on the different kinds of soil on his farm. A few experiments that this scheme naturally suggests can be developed and carried out by each fruit grower for a series of years to the marked benefit of the operator. A ready mixed fertilizer unless it has a formula especially compounded to reach ones local conditions must be regarded as unsuited for this kind of work. A little acid phosphate and potash in some form quite free from the other elements, used in connection with stable manure in carrying proportions will give us definite results either for or against increased expenditures in this line.

Another element that vitally affects soil building and crop feeding is the character of the season. With the delicate structure of small fruits it is quite easy to over fertilize in wet seasons and consequently under feed in dry seasons, hence in any system of experimental fertilizing the character of the season must be taken into consideration. Under intensive methods experience often demonstrates the desirability of making two or more applications of concentrates in a growing season thus fitting more closely the formula used to the season as well as the soil and crop requirements. Again in a cold backward spring a very light application of a thoroughly soluble fertilizer may help the starting vines forward to an unexpected degree by simply furnishing a bit of available fertility at a period when owing to unfavorable

climatic conditions the plants make very slow progress for the want of available plant food at a critical time when but little natural food is in condition to be extracted from the soil.

In experimental fertilizing and especially in the small fruit plant results obtained are often apparently contradictory and must be noted by the operator with all of the local conditions both past and present thoroughly in mind. Hence the danger of the average fruit man to become side tracked on some simple condition quite overlooked and so plunge into a course of procedure entailing loss for many years in consequence.

In the subject of soil building we have a subject but partly understood. It is touched by infinity and only bring results as we incidentally or skillfully hit vital combination highly essential to the best development of the crop in hand.

DISCUSSION.

Mr. Hanchett: I should like to ask if he tried experiments with the raw phosphate rock.

Mr. Cook: Yes, we are very much interested in that subject of raw phosphate rock. It was but a few years ago that I bought a carload of phosphate rock from Tennessee and so we were watching it, not only on the strawberry, but on every other crop that we were growing on the farm. I take it that you all are aware that we need to decompose phosphate rock with either material that we take out of the horse stable manure or the acids of fresh manure in connection with it, in order to make it more available; even if we put it on clover sod we will find it becomes available somewhat, so while we have gotten marked results in the use of raw phosphate, and we are getting a great deal more in the use of rock phosphate than we do in acid phosphate, yet I am sure if we want to get the most we can out of a good rock phosphate for one or two years, the best we can do is to buy aciduous phosphate, because while the acid rock costs about $15 a ton more, and you can buy the raw rock, in carload lots for something like $8.00 or less, we must consider the acid rock content—it analyzes 26 per cent phosphoric acid, while the raw rock runs down to about 14.

Mr. Hanchett: Is there not danger of getting the soil acid by using the acid phosphate?

Mr. Cook: If you get some good practical chemists and take the chemical reaction of the acid phosphate, they will tell you that the hue and cry about using acid phosphate is pretty much all wind. I do not think we need have any fears whatever about acid phosphate ever making the land sour.

Mr. Spurbeck: Have you tried wood ashes?

Mr. Cook: Yes, a few years ago, while I was growing fruit in New York State I conducted experiments for three years at Cornell University with various kinds of fertilizers, and that was one of the things that we attempted to determine, to show the value of hardwood ashes in the fruit line and after watching it carefully for three years and using from a few hundred pounds to a ton to an acre, we were never able to perceive any results that we got from ashes on this Cornell sand and clay soil. I want to emphasize that, our soils were mixed, they were largely made up of clay soils and gravels in varying proportions.

Mr. Hanchett: Have you tried any experiments with lime in the soil?

Mr. Cook: We have to some extent. We found where the soil was extremely hard and impervious to anything that came in contact with it, a light application of lime would tend much to loosen the hard soil. We never found the lime any better than acid phosphate. Acid phosphate is largely lime and we get a great deal of lime in that way. Unless we have those conditions that I mentioned, I do not think that lime is really necessary.

Mr. Hey: How do you apply salt?

Mr. Cook: Just as we apply the fertilizer where we have a bed growing like this bed of which I showed the photograph, we go between the rows in that narrow space and just scatter it over the vines.

The President: In New York they are using ground limestone. Have you experimented with that?

Mr. Cook: No, we have not.

Mr. Hager: I want to ask you if you have conducted any experiments, or if anybody would know what fertilizer to use on strawberry beds where you are almost continuously growing strawberries, if there is any commercial fertilizer that would fill in there, or, in other words elements that the strawberry has taken from the ground that the ordinary stable manure will not replace. My area is limited and I have to use the same land for strawberries repeatedly.

Mr. Cook: The strawberries that we grow are pretty much all water, except five per cent, and very little is taken from the soil except nitrogen and phosphoric acid and stable manure ought to replace these. In Michigan we have what I have called for want of a better name the "black root." I know it is over most all the states in the union, and under those conditions I would not under any circumstances go back to the same soil for a number of years and hope to have a clean crop of strawberries. I know it is one of the most fatal things that we can meet in a strawberry field; it is as fatal as the peach yellows is to the peach and it is hard to fight, and the only thing we can do is to get away from it, and you people have been buying plants from other states and I know Michigan has been subject to it for a great many years, and Ohio and Maryland, and I could mention several others and I do not see how it is possible that you have escaped it.

Mr. Hager: I have raised three successive crops in the last six years on the same plot of ground, and I wondered if I could continue to do that?

Mr. Cook: There is one thing to be borne in mind, and that is, in small fruits like in everything else, nothing succeeds like success. If you are successful in raising crops, I congratulate you, but in Michigan, where we go back to the same soil we feel sure of a failure, so if you have scored a success I congratulate you on your success, but I would go ahead with a great deal of caution.

A Member: How is bone meal?

Mr. Cook: We found bone meal in proportion to the amount of phosphoric acid it supplies, costs a great deal more than acid rock and when it comes to results, it really is no more valuable; a certain per cent of phosphate in the acid rock is just as satisfactory and a plant will do just as well as it will on bone meal and the last few years we have not used bone meal at all.

Mr. Kellogg: Has Mr. Cook had any experience with this black root rot on the ground where he grows plants?

Mr. Cook: Indeed, we are up against that proposition. We are growing plants every year and we have had experience with it under all conditions and everywhere, and I find this one thing about the disease, that if in the fall of the year we dig plants to ship to some special customer, or dig to heel in ourselves, to carry them over to set first thing in the spring, when we dig up the plants in the fall they will look pretty good and in the spring they are all rotten with that miserable disease, so all I can say is to be

exceedingly careful and calculate when we come to plotting our blocks, that we do not get this monster on our hands.

Mr. Richardson: You speak of that as a disease—that is my impression, but on what ground do you base that statement that it is a disease, what fact backs that statement, that it is a disease and not weather conditions, as so many claim?

Mr.Cook: Three years ago Prof. Taft of the State Agricultural College held to that point, that it was a condition and not a disease, and that year we had been doing quite a little experimenting with the black rot, and so while it seems to me that perhaps as the gentleman puts the question, that he who affirms must prove, still I think the man that affirms that it is not a disease is the man that must prove it. Let me tell you, it has all the symptoms of a disease, it persists and when it gets into the soil you cannot get rid of it until you rotate that piece of land. When we have a wet year and humid conditions it hurts the plants worse, and it cuts the crop off more. I was able four or five years ago to find one man in the state of Michigan that had perfectly clean roots, he had plants to sell, I got 3,000 Aromas from him, as nice as I could expect, washing every bit of dirt off, I could not find a trace of that black rot; I took those home and put them right by the side of plants that I knew were affected, and in the course of that year the plants I knew were looking all right, as far as my investigation disclosed, made just four times the growth and showed four times the vigor right along that the other plants did, and while they were affected the following fall, yet the roots were in better shape than the others, and next spring, when I came to take them out and set them out in a new bed, very much to my chagrin, the roots were just as much diseased from those plants that came home seemingly well as from those that I knew were badly affected. That forced me to the conclusion that it must be a disease. Until we can locate the germ and until we can work out a life history of it I suppose no one can answer it absolutely, but, as I said, four years ago the Michigan Agricultural College took up the question and a year ago Dr. Herschel told me he thought he had the germ isolated and that they would have a life history to work out soon. Cornell University has been working at it twelve years, and while they admit it is a disease, they do not now know any more about it than they did. I was not surprised a couple of years ago to run across Dr. Herschel—I asked him how that disease was getting along, and he said, "We are thrown off the track,

we do not know anything about it at all." I have told you about as much as I know about it, so I think the safest way for us as strawberry growers is to assume that it is a disease and to assume that it is a very dangerous disease that will strike right at the very foundation of successful strawberry growing and take that method that will help us to steer around it, if possible.

Mr. Richardson: Concerning the question of fertilizer and mulch, how is coarse stable manure for mulch?

Mr. Cook: That is a question that will have to be determined locally, I am sure; it would depend on what the soil contains and how the soil has been treated and how the plants are growing, too. We have used on poorer lands, where we thought there was not enough nitrogen and perhaps not enough vegetable matter, we have used horse manure with plenty of straw and under those conditions we got more berries. On the contrary, if we have soil fitted primarily for a strawberry crop and we have the fertility, as nearly as we can ascertain, I think we make a great mistake to put anything with much manure on a fruiting strawberry bed. In watching the black root, you will have noticed under a heavy mulch this disease is much more active than in an open soil. Digging that ground up thoroughly in the spring for the express purpose of getting the sun into the soil will do away with the continual effects that mulch provides for this *disease,* or this *something* that does us a lot of harm.

Mr. Hanchett: I did not find a strawberry in the region of Benton Harbor that had a bit of mulch, except weeds.

Mr. Cook: For a great many years they have been growing peaches, raspberries and blackberries, and they did not have enough farmers to furnish sufficient mulch, and actually the mulching of strawberries was absolutely out of the question, and if we had just thrown up the strawberry business and not been growing them, it would have been much better, but to think that those fellows fell back on the lazy man's method and gave strawberries a black eye is what I do not like.

GRAPE CULTURE.

EDWIN H. RIEHL, Alton, Ill.

Next to the apple the grape is undoubtedly the most valuable fruit that grows on American soil, and in parts of the country, is regarded as King of all fruits. Surely it is the most accommodating fruit we cultivate, succeeding as it does in every clime and soil, north, east, south and west when varieties are selected to suit the different sections. While the grape is partial to certain soils and other conditions, it is possible to grow it even under adverse conditions in any part of the country.

Bears early and yields more abundantly considering the amount of ground it occupies than any other fruit. Our long list of varieties gives us a greater choice of quality than we have in any other fruit and gives us a longer succession, from early July until after frost; lives longest and is the easiest to propagate. Can be grown to perfection on steep hillsides, where nothing else could be grown profitably.

May be preserved and put to more and more healthful uses than other fruits. Surely, then, we are justified in calling it the most useful and accommodating plant.

Exposure and Soil—Select the most open sunny exposure, preferably sloping slightly to the south or east. Such an exposure has a tendency to guard off mildew and rot to which many of our best varieties are subject.

A deep, loamy, limestone soil, dry and deeply worked is the ideal soil for the cultivated grape. This does not mean where these conditions can not be had, the grapes can not be grown, for, as stated before, by proper selection of varieties it can be grown under the most adverse conditions, though naturally not to the point of perfection, as where conditions are most favorable.

Varieties—Although we have an end'ess list of varieties that may be grown in the east and middle west with more or less success, I will only mention a few that are most hardy, vigorous, productive and of good quality. The old reliable Concord should, perhaps, have first consideration, for it has been said repeatedly, "when in doubt plant Concord." Worden, a seedling of Concord, is an improvement on the parent in size and quality, and

with a little extra care in the way of pollinating and pruning, it deserves a place in the family garden. Its skin is too thin and tender for a market grape.

Along this line we have the Mc Pike, a seedling of the latter, almost a duplicate of its parent, excepting that it is larger. A very interesting variety, being the largest, and at the same time, the best in quality of any black grape known. Too tender for shipping.

King is a most excellent variety of this class, supposed to be a sport from Concord. Almost as large as Mc Pike, not quite so good in quality, but ripens evenly, and with the skin of the Concord, is a good market sort.

Moore's Early is one of the best early, hardy, large, black grapes.

Eclipse is regarded by all who have tested it to be the best, early, black grape on the market. This variety originated at the writer's home and was introduced two years ago.

Niagara is the best white grape ever introduced, but is a little inclined to be tender, and at the north should be well protected.

Moore's Diamond and Green Mountain would be good white grapes for the north as they are very hardy; both are of fine quality.

Lutie is the best red grape for the north, because of its earliness and extreme hardiness. Very vigorous and a sure bearer.

Woodruff is another good, hardy, red grape. Could mention many other sorts that we grow successfully in Illinois, but as this paper is written chiefly for northern growers, the above list of the hardiest varieties will probably be ample for their needs. It would be a waste of time for any one in the east or central west to attempt the growing of California or foreign varieties or the Scuppernong of the south. They succeed admirably where they belong but are out of place here.

Cultivation—The grape for best results should have good cultivation and liberal feeding. In Illinois we get good results by cultivating two or three times in spring and then sowing cowpeas. The peas, keep down weeds, enrich the soil and serve as a cover crop in winter. In early spring these are plowed under, and if possible an application of good stable manure is given and later plowed under. Frequent stirrings of the soil are continued the rest of the season and the next year cowpeas are used as before.

There are two reasons why the old single stake method is to be preferred to a trellis or arbor. One is, that where ground is not too sloping, it admits of cultivation both ways with a horse, thus saving the slow and tedious work with the hoe, and furthermore the cultivator does better work. The other is, that by the stake system, the amateur is not so liable to injure his vines by leaving too much fruiting wood, thus allowing the vines to overbear.

There is very much less danger of injuring a vine by pruning too severely, than by leaving too much bearing wood. The amateur with trellis or arbor, attempts to cover every slat or wire with dormant wood, thinking that in this way he will get an abundance of both shade and fruit.

The fact is that an arbor can not be made a success if both are expected. Vines should be cut back severely each season and the arbor covered with the new growth, and the less fruit produced the better will be the shade. The trellis is all right for the experienced vineyardist who knows just how much bearing wood should be left on the different varieties he grows, because if put up right it is permanent, and gives space for supporting the young growth. Not all varieties can be pruned alike, each vine must be pruned according to its vigor; and just how to do this properly can only be learned by experience and a careful study of the habits of different varieties. What is called the renewal system, is the best method of pruning most varieties. To describe this briefly each crop is produced on a new cane of the previous year's growth and while this cane is fruiting another is being grown to produce a crop the next season.

Some varieties like Norton's Virginia and Cynthiana do better by allowing the original cane to remain for several years and the fruit produced on laterals sent out from spurs of the main vine.

The stronger shoots produced during the growing season should be tied up frequently as they advance in growth and the weaker ones rubbed off soon after they start.

When the fruit bearing laterals have made three leaves beyond the last bunch, the end of this lateral should be pinched off with thumb and finger. Do not pinch closer than this or like some, allow a longer growth, and then prune with a knife when wood is hard. Remember that foliage means health and vigor to the vine, which is essential if a crop is expected.

Propagation—As mentioned in the first part of this paper the grape is very easy to propagate. Excepting McPike all the varieties mentioned are easily grown from cuttings in the open ground; the latter being a little more difficult to root in this way. There is a class of grapes, to which Norton's Virginia belongs, that is difficult to grow in this way, and must be grown from layers or grafting. There are however, favorable localities and soil where even this hardwood class can be grown successfully from cuttings.

The art of grafting is frequently of much value to the vine-yardist. At my home there were at times hundreds of vines in our vineyards that were not profitable, brought about by testing new varieties as they were introduced and planting too largely of some newcomer that was boomed and praised to such an extent that we could not resist planting largely, instead of but a few vines for testing.

Upon learning that varieties were of little or no value to us, they were promptly changed to other sorts we knew would give us good results. By grafting we take advantage of the strong established root and lose but one year's crop of fruit. It is also a means of getting a good supply of propagating wood quickly of new sorts that we know are of real value.

Insects and other Pests—The grape has several insect pests which however strange to say, are not permanent; for instance the leaf-hopper, which is unknown in our section, has been known to defoliate entirely large vineyards in the southern states, and they only appear there once in several years. As a remedy I would suggest that as soon as noticed, the best bunches be bagged; the rest pulled off and the vines thoroughly sprayed with Paris Green or Arsenate of Lead.

The grape vine flea-beetle is some seasons, very destructive in our vineyards by eating the buds just as they begin to swell in spring. These can only be held in check by hand picking.

Mildew and Anthracnose are diseases of the grape which prey on varieties having weak foliage, such as hybrids with too much foreign blood in them. It is not troublesome to the varieties recommended in this article. These pests are best held in check by close pruning and liberal feeding.

Black Rot is a fungus pest, which in some parts of the country is destructive to the extent of destroying crops entirely. Is

Exhibit of Wisconsin Fruits. State Fair, 1908.

most prevalent in warm, rainy seasons. All but the hard wood varieties are subject to the rot, which, however, is easily prevented by spraying several times during the growing season with Bordeaux mixture.

Birds—Among our many fruit loving birds there are but two that we must deny what they consider their share of the grape crop.

The Oriole, the prettiest bird that flies in our section and a sweet singer is so destructive that one bird in a vineyard of fancy fruit will destroy $10.00 worth of fruit in one day. Just imagine then the result of 100 of these birds in a small vineyard. This bird, unlike others, does not eat a few berries and go on about the better work of catching insects, but is what might be called a grape-juice sucker. Flies from one vine to another, picks out the fines bunches and punctures enough berries on each bunch he selects to spoil it for market. The only successful way of combatting this pest is to spray piercingly with No. 10 shot.

The despised English Sparrow is very troublesome to small berried varieties. They swallow the whole berries and in a short time will strip vines completely. They seldom molest large berried sorts. Would recommend same treatment as for the Oriole.

Winter Protection—An important point possessed by this fruit is that it is the easiest of all to protect in winter, which makes it of special value at the north where many other fruits can not be grown.

About the time severe winter is expected the vines should be pruned, bent to the ground and securely covered with earth. In early spring uncover and tie neatly to their support.

Bagging the Grape—Those having but a few vines or a small vineyard, will find bagging the best means of preserving and protecting the fruit on the vine. This is done by slipping strong paper bags over the good bunches and securing them with small twine, wire or pins. Small bunches should be pulled off. Nimble fingers can do this work rapidly and it secures the fruit from rot and birds and preserves that rich bloom on the berries which is very effective when grapes are to be used for exhibition or fancy market.

Gathering and Marketing—We like the plan of packing right

from the vine with but one handling and that, where possible, only by the stem. This to be sure is for fancy fruit and we should strive to have our crop represent as large a per cent of that grade as possible. There is no danger of our markets ever becoming overstocked with strictly fancy fruit yet right here is another point in favor of the grape; no matter in what condition the market may be, there is always a place for the lower grades, which, in the case of other fruits, would be a loss.

The small and loose clusters may be easily turned into first class products in the form of Jelly, Jam, Grape-Juice, Wine, etc. Nothing in the way of dried fruits is quite so wholesome and valuable as the raisin.

We pack much of our best fruit in the till or tomato baskets, four of these to a crate. The climax basket is also used extensively. It is needless to say much more about packing, than to refer to the advisability of having the quality uniform from top to bottom of package.

It is also a good plan to put a neat label on each package, bearing the grower's name, and have one reliable dealer to handle your entire crop. In this way we may quickly gain a reputation that other growers will envy.

The grape ranks high as a market fruit. Millions of dollars worth of the fruit is turned into wine alone, annually. Some will say "What a pity to put this luscious fruit into a despised fermented form." To this I will answer, if people must and will have it, why not give it to them in this most pure, healthy, wholesome form, thereby displacing much of the vile, poisonous stuff that would otherwise be used in its stead.

The apple may justly hold the honor as King of all fruit, but surely the grape has no peer when it comes to a fruit for the masses.

DISCUSSION.

Mr. Toole: I thought I heard you speak of the Worden, "if carefully pruned and pollenized," is that what you said?

Mr. Riehl: You refer to the fact that the Worden does not pollenize perfectly?

Mr. Toole: That is what I thought you would have us in-

fer. Do you plant some other variety near by, or do you artificially pollenize?

Mr. Riehl: When you have a variety like that, it is well to plant it in a mixed vineyard, having several other varieties near by. The Worden has that fault of not pollenizing perfectly always. Some seasons it does right well even by itself, other seasons it does not. That may be accounted for perhaps that some seasons the insects and bees can fly during blooming time and other years it may be cloudy and cold, so that insects and bees do not get around to do the pollenizing for us.

Mr. Sperbeck: Did you mention the Delaware?

Mr. Riehl: Yes, as I stated before, there are a number of varieties down there that we would be safe in planting, but that perhaps would be a little tender here. The Delaware, for instance, is a splendid grape when it succeeds, but it is not generally reliable in large sections. It is a little weak in foliage. It is all right for the expert vineyardist who studies its requirements and prunes it back severely and gives it plenty of food. The same is true of the Catawba. The old Catawba was introduced before 1866; also the Isabella, they are still good too.

Mr. Spurbeck: Do you grow the Rogers' 15?

Mr. Riehl: We have tried all the Rogers, some of them are most excellent. All are fine black grapes and you could scarcely wish anything better in the hands of the expert, but it would not do to recommend them to the amateur, because they must be watched closely and pruned closely.

CURRANTS AND GOOSEBERRIES.

E. E. DUNNING, Milwaukee.

There are two kinds of Horticulturists, one makes his money on the farm, and spends it in the city, the other earns his money in the city and spends it in the country. We come under the head of the latter and with this understanding you will not expect to hear much you do not know.

We are just like a sponge ready to be squeezed of what knowledge we have absorbed in order to take up a greater

knowledge from others here with more experience. It was only with this thought that I consented to present this paper giving mostly our short history of small fruit culture in Milwaukee County, especially currants and gooseberries.

We have noticed that the papers and discussions of this society for the past few years have been almost entirely confined to strawberries in way of small fruit and apples for tree fruit and have asked ourselves why more was not brought out regarding raspberries, blackberries, currants and gooseberries, and also cherries as our experience thus far teach us that these fruits are a feasible Wisconsin product and quite as profitable in a series of years as the strawberry and apple provided you have the facilities for heavy mulching and getting pickers in sufficient numbers at the proper time to harvest the crop.

The currant and gooseberry is something that will not freeze out in our coldest winters, which is not absolutely certain with other fruit, although we have raised Eldorado blackberries for the past five years without the loss of a bush.

You are certain to raise practically every bush you plant and once started they continue to bear from year to year with proper cultivation, mulching, etc.

We have been told by at least three neighboring farmers that they plowed up their currants on account of the currant worm. Any one who would do this provided he knew how easy it was to get rid of them would allow grass and weeds to choke out his strawberries, and his apple trees to become almost useless for want of spraying, pruning, etc., and in the business world would soon have the sheriff's signature on his door.

We take it that each member of this society understands that there is no great success in any branch of Horticulture except along the lines of constant work and attention during the season, doing the right thing at the right time. With the currant and gooseberry it is this and nothing more. So far we must say we see no discouragements in growing this fruit in Wisconsin commercially in proper locations, especially tributary to our larger cities; whatever losses we have met with have been lack of knowledge and not of opportunity and such mistakes simply pave the way to ultimate success.

Now regarding our experience, I say "Our" as I am in business in the city and my partner, Mrs. Dunning, is the real overseer of the little fruit farm and greenhouse.

Five years ago last spring we planted about 50 each of apple, plum, pear and cherry trees, 500 Loudon raspberry and 500 Eldorado blackberry bushes and the following spring 7,000 strawberry plants. We mention these in order to show you that we have had experience with these fruits, and with the exception of increasing the cherry trees up to 400 and the Eldorado blackberries to about 2 acres, our increase has and will be the currant, the strongest possible evidence of our faith in them.

Four years ago last spring we planted 500 Fay currant and 500 Downing gooseberry bushes, the following spring, that is to say three years ago last spring, we planted 500 more Fay currant and 500 more Downing gooseberry bushes, in July of that year we marketed about $70.00 worth of fruit from the original 1,000 little currant and gooseberry bushes, from less than ½ an acre of ground. Two years ago we planted 2,000 more Fay and 100 Pomona currant bushes. The two previous years planting yielded about the same comparatively as the year before.

One year ago last spring we did not plant currants or gooseberries but we increased our Eldorado blackberry patch materially.

In July of that year the 500 original Downing gooseberry bushes yielded just an even $130.00 from less than ¼ of an acre of ground. The 500 original Fay currant bushes only about $70.00. Right here we find a characteristic of the Fay currant. The year before this I succeeded in getting a man on the place who could not find time and energy to draw fertilizer from the city as we had done previously and since, and that explains the comparatively small yield of the Fays, the next year they were mulched heavily and last July the yield was enormous. I am sorry to say a misjudgment on my part makes it impossible to tell what the yield would have been in quantity of fruitage or money returns, all 3,000 Fay currant bushes were equally heavily loaded compared to age and size, it did not seem possible to get many more clusters on the wood than grew there. I did not realize what we had, and started to pick one wagon load of crates a day and was leaving the older and larger bushes for the last, they over-ripened and one extremely hot day came just at this time and literally cooked them on the bushes, in this way we lost many bushels, but a 16 quart crate from two of the older

bushes was not at all unusual. The gooseberries got cooked in the same way.

We would advise, however, to go slow on the Fay currant, our land is heavy clay loam and we use at least 25 loads of mulching to the acre every year. It is our opinion that on lighter soil or with less fertilizing they would not prove profitable. While this last year the 100 Pomona bushes did not yield any more than 100 average Fays of the same age, they show more vigorous growth of wood and were also heavily loaded and we think would prove far more certain in a series of years or under less favorable circumstances. Last spring we planted 1,300 more Pomona and 2,000 Red Cross currant bushes and have arranged for 1,000 more of each of these two varieties for this next spring. This will give us over 8,000 currant bushes in all. Our Red Cross show vigorous growth and we expect greater results from those.

We spray the currants and gooseberries at least once a year with Bordeaux as the leaves open, and just as soon as the worms appear, with Hellebore, if they get thick before noticed would try Paris green, 1 pound to 200 gallons of water, but would hesitate to use this too close to picking. We should watch close for the worms and not let them get the start of us, we find they generally come after a heavy rain. We keep the bushes cultivated and as free from grass or weeds as possible, pruned and mulched as above mentioned. If there is more to do we know not what.

We bought our little farm and have put money into it to mature the fruit and greenhouse in order to provide against any possible reverses in business and we think so far as the future in this world is concerned we can say we know in what we have trusted and it will be able to keep us against that day.

DISCUSSION.

Mr. Hey: Have you ever tried the Perfection currant?

Mr. Dunning: I am not able to inform you very generally in regard to those things. I have practically given you all my experience in the paper. I have investigated the Perfection, I have not tried it personally, but I have investigated it somewhat and I believe it is a splendid currant. It may possibly be the best currant that is grown, but of course it is somewhat new yet and I think that one trouble is that where the currant is so very large, that it is not apt to yield as heavily per acre. We raise the Fay,

our rows are six feet apart, yet the bushes actually came together in the middle, but I have never seen anybody's else do it. Our land is enormously rich. I raised corn on this same land before planting to currants that made stalks which were simply wonderful, then put twenty-five loads, big, heavy loads, of manure from the city for each acre and we are going to have pretty good results. I do not think anything short of that will do for a Fay currant; I would not advise anybody to plant that currant.

Mr. M. S. Kellogg: Do you get a growth of the Fay bush that holds the fruit out of the mud?

Mr. Dunning: No, the Fay is a rather slender bush; the tendency is to bend over, the tendency is to grow down and where they are heavily loaded, as ours were this year, they do not hold up the fruit. Of course the fruit is not all on the ground, but much of it.

Mr. Geo. J. Kellogg: Our friend Stickney of Wauwatosa was heavily in the currant business. After planting several thousand Fays he dug them all up, discarded them entirely, and planted other varieties, because of this low spreading tendency.

Mr. Riehl: In regard to the Perfection currant, we have tested it thoroughly in the Stations down there and, I would say that seems to be well named, as it would indicate the finest currant that could possibly be imagined, in size of berry, size of bunch, productiveness, upright growth, vigor and in every respect we have never yet been able to find a single thing in which it could be improved.

Mr. M. S. Kellogg: Has it yielded as heavily as the Pomona?

Mr. Riehl: Yes, it could not yield heavier. The berries covered so heavily that you could not see the wood growth and yet strong enough to ripen up the fruit perfectly. Mildew is one thing that we must seriously consider in growing gooseberries. We must not attempt any of those foreign varieties, because the mildew will get them every time. We must resort to such varieties as the Downing, Pearl and those that are freest from that pest.

Mr. Dunning: I should like to ask one question. As I told you, we had not grown any of those Red Cross, except the ones we planted this spring. What I came here for is to get a little more information, if possible. Is there anybody here that has grown Red Cross currant bushes, say five years with the Pomona and the Fay? I do not care so much about the Fay, because I am

satisfied a person would have to live very near a city, where they could get all they could possibly want of the food they like. What I want to get is the comparative value between the Pomona and the Red Cross?

Mr. Spurbeck: The Red Cross with us is doing nicely. We think very much of it, and, as has been said here about the Fay, it will not stand up, it lies in the dirt too much.

Mr. Riehl: The Red Cross has a little of that tendency to droop as does the Fay, but not so much. In that way it is an improvement, and it approaches the Fay very closely in size and is also the same sweet quality.

Mr. M. S. Kellogg: We have grown the Red Cross for a few seasons, not sufficiently to determine exactly its market value, but with us we have been led to rely more on the Pomona and Wilder than we have on these newer kinds.

Mr. Melcher: I have grown Red Cross currants in a small way for ten years, and have grown it alongside the Pomona; we think more of it than of the Pomona, both as to quality and productiveness.

EVENING SESSION.—TUESDAY, JANUARY 12.

FARM BETTERMENT FOR THE WISCONSIN FARMER.

DANIEL D. CLARKE, Cambridge, Mass.

At the present time there is a widespread movement for a betterment of the conditions of life in all its aspects. All sections of the country, as well as all classes of its citizens, are represented in this hopeful struggle for more wholesome conditions of life and more attractive surroundings. Cities are endeavoring to provide parks, pleasure grounds and recreation areas for the present, and to ensure them for the future. Towns and villages are considering the better ordering of their streets, the treatment of open public spaces, and the providing of playgrounds. Countless individuals in all stations of life are zealous in their

endeavors to so adjust their grounds and buildings that they may serve their real ends in as attractive a manner as possible. They not only arrange and plant, but they are untiring in their efforts to maintain and to preserve. In this class the farmer has many representatives. Sometimes he is particularly successful. Yet most frequently he fails to secure much of the pleasure which is to be derived from country life. Is this not a pity? For who is more deserving than the farmer? He ought to share bounteously in all the things of life that are worth while. In his surroundings there is an absence of many of the limitations and hindrances which beset the dweller in the city, or even in the village. The natural beauty of land, sky and vegetation are about him. He is free from the vexing sounds, unsightly scenes and limited spaces which are a part of the present city life. His own acres are many, and often his neighbor's lands contribute quite as much to his pleasure as do his own. Ought not the farmer to be very thankful for the many natural advantages which may be made to contribute so generously to his joy and to that of his household?

Yet why concern ourselves with this matter of farm betterment? Why disturb the placid, sluggish, unresponsive tenor of our ways? What is the value of such improvements? Our surroundings will be more wholesome and sanitary. There will be greater convenience. Conditions of work will be more comfortable. There will be a real increase in the valuation of the farm. Then is there not a distinct joy in beautiful surroundings? Every successful attempt to make the country home more attractive, makes happier the lives of those who dwell within. Our natures respond to harmonious scenes. Manifest order and beauty delight the eye. Disorder and ugliness displease the eye, dwarf the nature of the individual and contribute to a grossness of life. On the other hand, beautiful surroundings tend to uplift life. They help their creators and observers to live more useful, happier and nobler lives. Then there is a value in setting a good example of right doing. Many a man by the proper ordering of his own grounds has done much to arouse and regenerate whole communities.

What are the means by which we as farmers can make our surroundings more pleasant? First we must free ourselves from the error that this pleasure depends solely upon the planting of trees and shrubs about our buildings and on our grounds. Al-

though judicious planting is essential and does contribute very largely to beauty, there are other factors more fundamental. If we are so fortunate as to be in the act of planning our farm, we will want to consider the kind of buildings best adapted to our particular purposes, the best sites for them, and their proper grouping; the location of the house and the orientation of its various parts; the disposition of the different divisions of the grounds and finally the connection of our buildings with one another and with the highway by drives and walks. When we have carefully thought out all of these problems it is time for us to discover where we shall plant our trees and shrubs and what shall be their character.

SELECTION OF SITES.

What are the principles that should govern us in the selection of our sites? There are the questions relating to health, to convenience, and to attractiveness. Health may be ill-affected by a contaminated supply of water, by the existence of unsanitary conditions, by a natural dampness of the site, and, to some extent, by a lack of protection from the elements. Therefore, to ensure good health our water supply should be reasonably secure from sources of contamination. It should not receive the surface flow from the barnyard nor seepage from place of sewage disposal. The area itself should be somewhat elevated and its drainage should be good. While advantage should be taken of natural shelter whether of land formation or of vegetation.

For convenience there should be first of all a near and abundant supply of water. Then the spot should be easily reached. There should be no obstacles requiring a devious way of approach, either from the highway or from the fields. Nor should the grades be uncomfortably steep. To save energy and time the farm buildings should be most convenient to the areas under cultivation. However, this location is not necessarily the center of the whole area, but the center of gravity as it were of the present and future farming operations. In general it is well to be near the most important highway. For not only is the maintenance of an unnecessary length of private way an unwarranted expense, but there is a corresponding loss of time and energy.

For attractiveness it is desirable to secure shelter from prevailing winds and storms. If there are no natural features adapted

to our purpose, we can at least do our best to select a site where some degree of artificial protection may be provided with the greatest advantage. Then it is desirable to enjoy as much sunlight as possible throughout the year. Even in the heat of summer it is very welcome for a part of the day at least. Another factor immediately involved in our happiness is the character of our views. We may not be able to secure noble views, yet we can always strive to avoid unsightly scenes. As to beauty, it is our obligation to select as attractive a spot as possible, or, in the absence of such a natural feature, to choose such a one as we can best make beautiful.

After we have selected our general site we will want to insure the advantages to be derived from the good grouping of the farm buildings. They should be grouped. There should be a logical relationship between them. Thus there will be greater compactness with a marked increase in the sum of convenience. There will be economy of construction, better protection and greater attractiveness. Not only will the structures themselves be better but they will enclose and provide for the concealment of unsightly features. Coming to the most important member of this group, the farm house, we cannot urge too earnestly the necessity for its cooperate planning with the home grounds, for there is a vital relationship existing between these two. The arrangement of the rooms is influenced by the possibilities of the grounds while in turn the arrangement of the grounds is influenced by the disposition of the rooms. The principal aspect of the house should be as nearly as possible south. In the ideal case the living room would be on the south, so that it might secure a maximum amount of light and sun. The dining room would be on the east so as to receive the early morning sunlight. The kitchen should be so placed as to have one side on the east, to share as much as possible of the morning light, while the library or den would be on the west as requiring but little early light. Likewise the hall would be entered from the west. However, it may be necessary to depart from this ideal, it should be the object to place the living room where it gets the sun's early warmth and a pleasant outlook over the home grounds.

Taken together we may make three divisions of the house and its grounds,—the service, the entrance, and the living. The service portion of the grounds which includes the service walk and drives and the clothes yard, ought to have convenient relationship

with the kitchen. They should also be completely screened from the living grounds and from the living portions of the house. The approach on the farm is usually simple. It should never intrude upon the family life; neither should the entrance drive or walks cut up the lawn of the living grounds. The entrance itself should be attractive and hospitable. The living grounds should surround at least two sides of the house. It should be so placed as to attain the best relationship to the points of the compass, to procure the best breezes and to include the best views. The lawns should be agreeably situated with regard to the living portion of the house. So should the flower gardens and borders be pleasantly related. The living grounds should be screened from the service, and from the approach and street and from all outside. There ought to be the feeling of privacy, security and comfort.

On our farms walks and drives are necessary to connect the buildings with one another, with the highway, and with the farm lands. It is essential that they should be included in the comprehensive farm plan. They should be studied in relation to the sites and to the grounds. If they are located independently unfortunate results may follow. For instance, the plot best adapted to the location of the house might not be accessible on easy grades, or there might be intervening obstacles. Then the house might be so placed that the drive must of necessity cut through the living lawn not only destroying the unity of the composition, but interfering with the privacy of the grounds. What are the requisites of good walks and drives? First of all the location should be logical. They are for use. They should be placed where they are needed. They should be direct. They should have no unnecessary meanderings or meaningless curves. In the main they should follow the topography. The grades should be easy and comfortable. For the approach drive it is best not to have the rise greater than five feet in a distance of one hundred feet, and it is well if the rise is not greater than two or three feet. With entrance walk the grade may be heavier, though in this case the rise should never be so steep as to cause discomfort. With regard to alignment, there are many determining factors. If the grounds are small and the land almost flat it is usually best to have straight walks and drives. For in such cases straight lines are most economical of space, most agreeable to use, and most satisfying to the eye. On larger places where the house is situ-

ated at some little distance from the road and the ground is more or less irregular, curving drives are usually best. Yet here there must be some reason for a curve. This justification may be a matter of grades, a projecting ledge or hillock, the necessity for preserving the integrity of the living lawn, but never a mere flower bed or a group of shrubs. There must be a real obstacle to onward progress. The curve itself should always be free, flowing and graceful. In all this matter the topography should be our guide. We should follow it, adjusting our lines so that they may be as graceful as possible while conforming to the facts of grades. Never should a walk of drive exist that is not really needed. Nor should the length and width be greater than utility requires. For a walk or a drive which has an unnecessary length or width exacts a waste of time and energy in passage and requires an uncalled for expense in construction and maintenance. With regard to construction, local conditions play a considerable part. If there is good native road material at hand it is desirable to use it. For it will usually be most economical as well as most harmonious with our grounds. There should be a compact mass, good drainage, and a uniform surface. Then there should be careful maintenance. The surface should be free from stones, the ruts should be filled and good drainage maintained. The line of demarcation between grass and gravel should be sharp. Grass and weeds should be kept out of the gravel itself. These definite edges and grass free surfaces do more to give snap and distinction to the grounds than almost any feature.

Now it is time for us to discover where we shall plant our trees and shrubs and what shall be their character. For successful results planting must always be done with a definite object in view. If there is no reason for it then it should not be done. The principal purposes of planting are as follows: to secure protection from sun, wind and storm; to screen unsightly features; to unite a building with its site; to enframe the lawn or grounds; and finally to secure the fulfillment of those pleasures which plants so abundantly bestow. This matter of protection is pretty well understood. There are formal rows of trees, tall hedges or irregular masses of trees and shrubs to shield from wind and storm. The house should have some shelter from the sun's rays in summer. The trees should not be too close to the house nor should the shade be too dense. Nor should they be so planted

as to shut out an undue amount of the sun's warmth and cheer or to hide pleasant views.

The concealing of objectionable features by means of planting is not so well understood nor so commonly practiced. In spite of our very best efforts, irritating or ugly scenes sometimes persist. Even if we have been successful in obliterating our own we may still have with us those of our neighbors. Our own ill-kept back yard with its clothes lines, its ash barrels, its swill tubs, our barnyard, at best temporarily, if not permanently in somewhat disorder, obtruding piggeries or henyards, the unsightly grounds of our neighbors, these are the objects that we should blot out from our view with planting.

For the most perfect marriage of the house with its site the building should have the appearance of being out of place anywhere else in the world. Most certainly should this union be taken into consideration when the site is selected and the house designed. Even when the very best is done in this respect a more complete harmony may always be effected by planting of some character. There may be a background of trees, there may be shrubs massed against the foundation, or there may be vines growing on the very house itself. At times one of these expedients will suffice, at another time all may be used with propriety to produce that harmony between the ground and the house which is so desirable of attainment.

Then the lawns or grounds should be enframed. This character of planting gives unity to the scene, enclosing it in much the way that an appropriate frame does a good picture. Then it secures a certain privacy and seclusion and gives the feeling of security and repose. Thus the value of the enframing planting is very real and very great.

Then plants may be used for the intrinsic pleasure which they afford. There is a charm of form, of texture and of color. Yet we must not permit these more obvious appeals to interfere with the realization of that greater, higher and more fundamental pleasure of good composition. There is a pleasure to be derived from the fitting arrangement of plants.

This logically leads to an examination of the principles governing good planting. These may be assembled under the heads of simplicity, breadth and harmony. As to simplicity, it ought to characterize our attempts. When we have determined our needs we must meet them in as straightforward a manner as possible.

Keep in view the fitness of the attempt. Avoid over-elaborateness. Likewise observe simplicity in the number of plants used. Do not crowd. Beware of an over use, particularly of trees and shrubs. Then choose comparatively few varieties.

As for breadth, what is it? It may be said to be the making of one feature principal and the keeping of subordinate features from obscuring or belittling it. The meaning may be clear when viewed in relation to some definite feature, as the lawn. This is the foreground of our scene and should be principal. It should have a fringe of shrubs or of trees and shrubs about its borders. Never should it be spotted with flower beds or cluttered and crowded with individual shrubs or groups of shrubs. Furthermore, if breadth is to be secured, this fringe of shrubs must be composed essentially of masses, not of single plants or of groups of two or three.

Harmony should prevail thoughout. The plants used on our grounds should be in perfect accord with our native vegetation. In fact it is well to let our own trees and shrubs form the framework of our plantation. To these we may add such worthy exotic plants as please us with the charm of their form, of their flowers, or of their fruit. Likewise there should be harmony between the trees and shrubs and their surroundings. They should not be too small nor too large. For instance the shrubs marking the foundation should not be so tall as to dwarf the house. This size-harmony should exist between the plants themselves. Usually a tall shrub and a low shrub should not be placed side by side. In the mass there should be a gradual graduation in height. There should be a nice transition from the grass to the tallest shrubs. Likewise harmony should prevail in the texture of the foliage. There should be a careful transition between shrubs with diverse textures of foliage. Then, particularly in the case of vines, there should be harmony between the foliage and the house or other structure, to which it is related. It should not be too large and coarse nor should it be in discord with the material of the building. Then the foliage of our trees and shrubs should harmonize in color as well as in texture. For our safety let us shun shrubs with so-called golden foliage and with variegated or blotched leaves, and use only sparingly and then with discretion trees or shrubs with reddish coloring.

Now that we have seen what we ought to do let us renew our determination to better our surroundings, for what greater influ-

ence can affect our lives than their character? If our surroundings be mean, so will our lives be mean. If they be sweet and beautiful, our lives will mirror their very goodness. Nor is this matter of influence mere speculation. Everywhere examples of evil and of good attest its truth. Great men of all times have proclaimed its power. If we have not already done so, let us take this season to study our problems, to determine our needs, and to formulate our scheme. It does not matter if it cannot be carried out at once or in its completeness. The real need is for a carefully thought-out and a fully preconceived plan. With us farmers it is to be expected that its execution will be gradual. Our incomes are neither constant nor large. There are other things to be done. There are unexpected items of expense to be met. Nor is this on the whole a disadvantage. This gradual and healthy working out of a scheme makes possible the avoidance of certain mistakes, permits of nicer adjustments, affords greater pleasure, and arouses a livelier interest. Thus we must say to ourselves what we would do to arrange our grounds and buildings to secure the greatest degree of comfort, contentment and joy, take on an abundant measure of courage, and do what we have to do steadfastly to the end. Yet we cannot stop here; for the most complete measure of farm betterment there must be an improvement in certain vital elements of rural life. There must be a corresponding betterment of our schools, of our churches, of our highways and of our villages.

IMPROVEMENT OF SCHOOL GROUNDS.

PROF. J. W. LIVINGSTON, Platteville Normal School.

That the school grounds should be made the most attractive place possible has long been incorporated as one of the essential articles of my pedagogical creed. To every man that asketh a reason for this faith that is in me I gladly give answer. Man's taste and character are in part fashioned by his surroundings. The better tendencies of head and heart draw new life from environments marked by purity, taste and refinement. Beautiful surroundings render the school itself more attractive and serve as a silent reminder, that the schoolroom should be kept neat

Grounds of Dodgeville high school. Evidently there are no "Keep-off-the-Grass" signs here

and attractive. To enlist the aid of boys and girls in improving and ornamenting the school-grounds means to cultivate *esprit de corps* which makes them more loyal to the school and its interests. The joy coming from helping make things go in their little republic, will lead to future loyalty in the broader citizenship of community, state, and nation. To the children whose parents have neither time nor means to provide their homes with things of beauty, an attractive school-yard becomes a joy forever, and no matter how humble the home, it gladly greets every effort to cheer and brighten the life of the children. A beautiful school-yard in a village or town means improved home yards and better kept lawns; and such a yard always means added interest and readier aid on the part of the patrons.

Many years of patient, persistent effort to improve school-grounds have produced some results and some experience that may prove suggestive. I am sure you will pardon the personal reference in bringing before you for practical illustration the story of two particular school-grounds. I take them simply because they are the ones best known to me and the ones for whose improvement I gladly lent a helping hand. The loyal work of the young people in Dodgeville made their school-grounds the pride of the town. Many an enjoyable trip was taken to the woods to find there hardy trees of attractive form, to take them up with care, and then to set them again in the earth where they would give delight to troops of happy children. The favorites of all were the elm, the hard maple, and the linden, for each has naturally a handsome form as well as beautiful foliage. Hedges of arbor vitae were planted to screen the backyard. A good lawn was secured, and each spring a thin coating of land plaster and ashes many times repaid its cost by the increased richness of coloring and rapidity of growth quickly seen in the velvety carpet. Clematis, climbing rose, and Virginia creeper planted around the building gave to the bare walls the grace and comeliness of their green drapery. Bright flower beds with vases and rustic baskets gave added color and beauty to the scene.

In Sparta the outlook for an attractive yard was rather discouraging. The high school was situated on a knoll of sand that was bare and uninviting. However, there were some handsome elms and oaks; and the natural slope from the building was

well suited for a lawn—if the grass could only be coaxed to grow.

The matter was quietly agitated among the boys and girls, and they were soon enthusiastically in favor of improving the grounds. The boys of the graduating class took a twenty-five dollar job and turned the proceeds into the decorating fund. Pupils and teachers soon gave all the money needed. A citizen who was excavating a large cellar donated fifty loads of loam. Sand holes were filled; the grade in front of the building was improved; a large surface was neatly sodded. The rest of the yard was treated to a liberal coating of a good fertilizer, and the grass seed was sown and raked in with care. Several large iron vases were purchased and some rustic baskets made. Basket and bedding plants were secured from the greenhouses. On Saturday there were plenty of willing hands to sift the soil, to help make flower beds; to set up rustic baskets; to rake up and wheel away any refuse rubbish; to dig up plantains and dandelions. Soon the yard presented an improved appearance and attracted the attention of passersby. The chronic croaker leaned on the fence long enough to watch the work and to encourage with the assurance that the plants would soon be stolen or destroyed, that our labor would be wasted, and that the bare sandbank would again come to the surface. The croaker's words were soon forgotten in the enjoyment of the smoothly shaven lawn, neatly trimmed trees, handsome flower mounds, and graceful vase or basket.

The following summer the students decided to work for an artesian well on the grounds. Fifty dollars were earned as a nucleus toward sinking the well, but the district meeting gave us money to secure a good flowing well, and our money added a neat fountain and a couple of drinking places. Each year brought some new feature to improve the yard. One of the things most interesting to the little people was a rustic bird house. This became the summer home of bluebirds and martins, to which they received cordial welcome every spring.

Later came the plans for a new high school. While the handsome new building was going up, fire destroyed the old home. This necessitated another new building. In the subsequent excavating and regrading not a square foot of our sod was left. The sand was again at the top and matters looked rather hopeless at first, but the clear grit of the young Spartans conquered

again the great sand bank and transformed it into a smooth lawn dotted here and there with clumps of shrubbery, bright flower bed or attractive vase.

Two hundred fifty loads of good soil were soon dumped outside our borders. Companies were formed to provide wheelbarrows, carts, shovels, spades and rakes. A merry crowd of more than two hundred were soon at work wheeling in the soil, leveling the surface, breaking lumps, carting away debris, or smoothly raking the added soil. Students and teachers kept at the task night after night until the entire yard was neat and trim. Then men were hired to sod the boulevard outside the walks. Grass seed was secured and sown. Shrubs and young trees were purchased and several Saturdays were celebrated as Arbor days. Next a tight high board fence was built to cut off the back yard, and immediately in front of this fence were planted vines and a long border of perennials to form an attractive background. The city fathers by request donated us city water to keep our grass and plants well watered during the hot summer months.

Some new rustic baskets were made and additional iron vases purchased. The fountain was repainted and reset. Beds of choice pansies graced the sheltered nooks. A fernery and a garden of wild flowers were started. Beds of brilliant verbenas and geraniums brightened the lawn, and the well filled vases and baskets added grace and beauty. Every student gave his mite to help on the good work and most of them gave muscle too. So each child became a loyal protector of that in which he had invested some capital and labor.

"But all this costs labor, time and money." Yes, *all* these, but the investment pays large dividends. To note the educative influence on the children, to observe the effect on the home yards, to find that the very roughest boy will carefully protect the flowers from injury, to see how proud the patrons become of "our school yard;" to enjoy the wondering surprise of the stranger when told that no plant is ever maliciously injured or stolen, to realize that such a yard may prove an effective object lesson to some fellow workers—these are some of the returns.

The frame surrounding a picture should harmonize with and enhance the beauty of the picture itself. A setting of pure gold seems none too good for a painting of great merit. On the other hand, to place around an inferior picture a pretentious

frame means poor taste on the part of its owner. Such a misfit emphasizes the defects and the gaudy frame brings out in strong contrast the poverty of the picture. So while I appeal tonight for improvement of school grounds my dominant note must be a call for improvement of the schools themselves.

A few years ago it was my privilege to spend one week with each superintendent of fifteen different counties of the state, to visit the country schools by day and to speak to the people each night on the betterment of their schools. Let me give you a bird's-eye view of the conditions that surround the country schools of Wisconsin.

In some northern counties we travel all day long through the great silent forest to find the lowly log cabin where a handful of children gather from the hardwood clearing wherein their sturdy fathers are toiling to make farm and homestead. Late of an afternoon we follow the iced logging-road under the shadow of the hemlock forest to a humble frame building for the children of lumber camp and sawmill settlement. Another week finds us in the hilly country discovering a rural school nestling in a nook by the steep roadway. Every boy at recess here catches up his skis, and tugs up the hillside to disappear from view. Six minutes later he comes sweeping down like a flash of light, with sparkling eyes, cheeks aglow, his flaxen hair streaming in the wind. These children are descendants of folk from the Norseland. Test the twenty-eight and not a child can hold up his thumb and say "I think this is a very thick thumb." Your sentence comes back from each one, "I tink dis is a werry tick tumb."

A week later under another leader we ride across the level marshes to stop at a cranberry settlement on a sort of island in the marshland where four families each furnish a quartet to make up the little school of sixteen. In still another section of our state the traveler drops into the deepest valleys and travels between the highest hills found in Wisconsin to stop at a weather-beaten schoolhouse by the roadside. To this building flows daily from each convergent coolie a stream of youthful life coming from the humble homes that dot the steep and unproductive hillsides. Later we emerge from this deep valley to enter the rich prairies where the great tobacco sheds tell of the dominant industry of that section, and the school registers tell of the many absences caused by the labor of planting, culti-

vating, cutting and curing this product of the soil. Another week brings a trip through the dairying section where cheese-factories and creameries dot the landscape more thickly than do the district schools. One week was spent in what the genial superintendent called the most rural of all Wisconsin counties. At that time this county was without a mile of railroad, had no saloon or jail, and within its borders there was not a single four-year high school. Here long rides across broad sandy stretches of scruboak and Jack pine led at length to the oases where we found a farmer settlement with its neat little school.

The visitor who thus travels through our state finds as wide diversity in the nativity of the children as in their varied surroundings. In one district every child is of Polish parentage, in another all speak Belgian, while in one not far away all are Bohemian. Scarcely a land or language of Southern and Western Europe fails to find its true representative settlement in some section of Wisconsin. Cosmopolitan indeed is this state of ours and great the problem of amalgamating these people of varied language, diverse customs, and divergent ideals. The public school must give the bond of a common language, inculcate new ideas and ideals, and bind together all these children by loyalty and love for our own state and nation.

There is a striking diversity in the size of these rural schools. A score enroll fewer than five children, while hundreds of them have an average attendance of fewer than ten. In two different schools I have found an enrollment of but three children, while in another there were registered ninety-seven.

The most deplorable discovery made was the fact that in many of the richest sections of the state there are whole townships in which not a single boy of twelve is enrolled in the public school. This was especially true in the region peopled almost entirely by foreigners. The speaker urged one boy of twelve to attend his little district school, but was met by the lad's declaration, "I did go, but I was the only big boy left, and so there wasn't enough to play even two old cat, and I quit." To this typical Badger boy had come the sense of utter isolation and lonliness that has driven thousands of Wisconsin farmer boys from these small and unattractive country schools.

In spite of all the educational progress our state is making, it brings a blush of shame to learn that two thousand country teachers of Wisconsin are today getting lower wages than is

paid to the kitchen girl in the cities of our state. Many a merchant or mechanic pays each year more to the maid who cooks his children's food than do all the farmer fathers of an entire district pay the young woman who is supposed to feed the intellectual and moral life of all the children of that community. Is it any wonder that such district schools can command the services of only untrained and inexperienced teachers with barely education enough to win a third grade certificate?

A DREARY PICTURE.

In the composite picture of more than two hundred schools visited there comes a touch of pathos. The rude box-car structure, frequently unpainted, stands by the roadside on its barren grounds devoid of bush or tree or vine to hide the utter nakedness. The two unsightly outbuildings standing in all their vulgar ugliness are often so filthy and so polluted with marks of profanity and obscenity that every fibre of manhood longs for match or torch to destroy utterly that which must taint the very fountains of purity. Inside are the dingy bare walls and curtainless windows. The absence of pictures, the dearth of equipment, the want of good teaching, the destitution and lack of uplift bring a feeling of chagrin that such conditions are possible in the proud state whose motto is "Forward."

Surely it should become a matter of state concern that the schools containing nearly one-half of our Wisconsin children should cease to have the poorest buildings, the most barren surroundings, the most meager equipment and the most poorly prepared teachers. Surely you, my friends, will willingly turn a little while tonight from thought of garden and orchard to consider the problem that touches most vitally the welfare of every farm home within the state.

In the solution of this great problem neighboring states are leaving Wisconsin far in the rear by establishing consolidated country schools and providing for transportation of the children. Ohio, Indiana, Illinois, and a score of other progressive states are thus taking out to their farm homes graded schools and high schools as creditable as those found in the more enterprising towns. Surely no adequate solution can come for this vital problem that does not give farmer boys and girls a chance

to measure up fairly well in education, power, and training with their city cousins.

OTHER STATES DO BETTER.

Wisconsin has already a few creditable township high schools. Let there be united and aggressive effort to increase their number, and to establish strong consolidated country schools wherever transportation seems most feasible. Let the buildings erected be attractive in architecture, modern in plan and equipment, flooded with pure air and abundant sunlight. Let there be provision made for teaching manual training and domestic science. Let the course of study touch more closely the art of agriculture and the life upon the farm. Give opportunity for the boys and girls in these schools to return each night to the farm roof to enjoy the sweet influences of home life and live under the watchful, sympathetic care of father and mother during those formative years when habits are being fixed and character is formed.

Let us provide for these attractive school homes appropriate and ample grounds. Let there be provision for a well-kept grassy lawn in front dotted with clumps of shrubbery and brightened with the color of a few flower mounds. For the background of the picture let there be fine shade trees and a graceful border of shrubbery. Let climbing rose and clinging vine give grace, to the symmetry of the building. Let both picture and setting be a source of satisfaction and pride on the part of every boy and girl fortunate enough to share the beauty and the benefits of this school home.

Let there be abundant room for school garden and grounds for agricultural experiments. Let there be grown here the best varieties of grains and Indian corn. Plan-out and cultivate a model farm garden wherein are grown the finest sorts of vegetables and small fruits. Let this school be kept in living touch with experiment stations of state and nation and with the agricultural schools of county and commonwealth. Let these gardens of the school and all its activities touch with living contact the varied interests of the farm life and the comforts of the farm home. Let the great underlying principles of botany, physics, chemistry, and physiography here be taught so clearly,

so simply, and so practically that they shall illuminate all future life and work of the farm home. Let this school become a distributing center for the best current literature that comes to uplift and improve rural life.

Let there be on this school campus abundant room for a playground where all the youth of the entire township may engage in strenuous games of football, baseball, basketball and all the vigorous sports that make for improved physical manhood. The country youth must be made to feel that country life means something more than long days and hard toil. Let him learn the games that give lithe limbs and supple bodies and bring the buoyancy and joy of living. Think what such mingling of all the young men of an entire township would mean in the enlarged social life and the fostering of broad public spirit. Contrast the stirring emulation and comradeship fostered here with the isolation and loneliness of the poor little country school where the boy declares, "There war't enough boys left to play even two old cat."

Let there be held in these central rural schools contests in declamation, oratory, and in debate with other schools of the state. Let there be given musical and literary entertainments. and a course of lectures by the best attainable talent. In other words, let this central rural school prove the intellectual, the social, and the spiritual center that shall uplift and unify the people, and create even in the children a consciousness that country life may be made ideal life for old and young alike. The poverty and the weakness of the average country school is the factor that is doing most to drive to the city the best and most enterprising young people found in the farm homes. The modern model consolidated country school will lead the farmer boys and girls to love country life and to find in their father's vocation one that means strength of body, peace of mind, independence, competence, comfort and joy of life.

From such environment and training the intelligent young farmer learns that he may here wisely invest the best of knowledge, training and skill. The daily toil has ceased to be a grind, for he has come to regard himself as a productive factor in the great economy of the world. He finds new beauty in flower and bush and tree. Earth and air and sky speak a language full of meaning for him. The sprouting seed, the growing plant, the

forming flower, the fertilizing pollen, the ripening fruit are for him miracles full of meaning. Around his own fireside the good and great of all time gather at his call to converse with him and with his children. In the enjoyment of home and farm and garden this farmer finds the peace and contentment of a new Eden. This education has made the farmer a more intelligent worker, a clearer thinker, a broader, better citizen, and a worthier man.

Our versatile president recently appointed an able commission to investigate the conditions of country life and to suggest a solution for some of the farmer's most serious problems. In a session of this commission recently held at Madison, the farmer folk of Wisconsin gave testimony that the problem of good country schools is the vital one that needs solution. Many a farmer is leaving the old home to seek in town or city some other means of livelihood while he there educates his children. Thousands of farmer fathers and mothers are now sending away from home the boy and girl of fourteen that they may win in the city the high school education denied them at home. Today I came through a town having a population of twenty-five hundred where two thousand dollars in annual tuition is taken from farmer boys and girls attending that one high school. Thousands of country boys and girls ambitious to win such a high school education cannot be spared from the farm and a still greater number are deprived of this privilege because their parents cannot afford the cost for four years of sending their children to the city high school.

Brainy men in every part of our land are organizing in intelligent effort to solve the problem of the rural school. Brains are bettering country roads, are harnessing Nature's forces to farm machinery, and carrying modern comforts to the farm home. The brain and heart of the nation made possible daily mail delivery for every post office box found now on the farm yard gate of the most remote country places. The wealth expended in this rural free delivery counts for naught against the added comfort it brings and the increased intelligence it fosters. Aerial navigation has been made possible by American invention. Surely the combined intelligence of the nation will find a way or make one to give a square deal to the young people growing up on the farm. Whether the solution be consolidation or some newer plan, it must bring to all equal opportunity to win a diploma from the college of the common people. Surely our state will not let increased

cost count against giving as a birthright to every Badger boy and girl the opportunity of a high school education. Education all the way from the kindergarten up to and through the great state university should be for every Wisconsin youth as free as the water he drinks, the air he breathes and the sunshine he enjoys.

Let the State Horticultural Society lend its energy and wield its influence for the attainment of this ideal. For these consolidated country schools it will prove a delight to furnish free plans for ample grounds with grassy lawns and green shade trees, with school gardens and experimental grounds, with roomy playgrounds, and with all the environment of beauty and culture that shall bring joy to the hearts of all country boys and girls now hungering for the higher and better things.

AFTERNOON SESSION—WEDNESDAY, JANUARY 13.

Mr. Toole, the newly elected President, took the chair.

The President: Dr. Loope is here and has something to bring before you which I think you will be pleased to consider.

Dr. Loope: I often wish that I were eloquent, that I could make a speech that would thrill you, but the only way I have to talk is just in a common sort of way. We have in our society a man whose whole life has been devoted to horticultural subjects, very largely, almost exclusively, who has studied the subject exhaustively, who has made a friend of horticultural knowledge in the State of Wisconsin, you might say; who has been connected with this Society for many years, from its inception, and is today one of our oldest and most respected members, a man whom you all know and you could not help respect if you ever saw him, and if you did not know him, why, he would impress himself on you so that you would remember him. It has always been so, and I want to move you now that in consequence of the many, many horticultural truths he has brought forth and his horticultural knowledge, and the fact that he has been a power in the Society, I want to nominate Mr. George J. Kellogg for an honorary life member of this Society as a mark of particularly distinguished merit.

Mr. Richardson: Mr. President, on behalf of the younger members of the Wisconsin State Horticultural Society, as a

recognition on our part of his upright character and sterling integrity and of the benefits conferred upon our Society, and, broader than that, for the benefits that this man has conferred upon the horticultural interests of Wisconsin and of the Northwest, I rise here today to second the nomination of George J. Kellogg for honorary life membership in our Society, believing that in so doing we are conferring upon the staunch old veteran of many summers the highest honor that lies in the power of this Society to present. As I said, on behalf of the younger members of this Society I second that nomination.

Mr. Smith: In behalf of the Gardeners' and Foremen's Association of Lake Geneva, I wish to further second that nomination.

The President: The most honorary within the gift of this Society. We desire to make it as cordial and emphatic as possible, and therefore I ask you to sustain it with rising vote.

Motion unanimously carried by a rising vote.

The President: We will be pleased if Mr. Kellogg will at least rise, if he does not feel like speaking.

Mr. Kellogg: This has taken me by surprise. They put on a little too much taffy. I might object that it did not come years ago; I do not know that I was entitled to it, but I thank you very kindly for the expression, and the unanimous expression. I have not been all these years working for the Society; I have been working for myself, but I have done what I could, I thought I did at least and when I quit the nursery work and went to Lake Mills to quit work, I quit it by setting out 80 varieties of strawberries, and I have been quitting it ever since, and I have got so that in the summer time I work on the eight-hour system, eight in the forenoon and eight in the afternoon. I have a quarter of an acre of ground that has 70 fruit trees growing and many of them bearing; I have probably over 100 varieties of apples growing on those top-grafted trees; one tree has 40 varieties; another 12 and another 15, and I have three pear trees this year that had to be propped up.

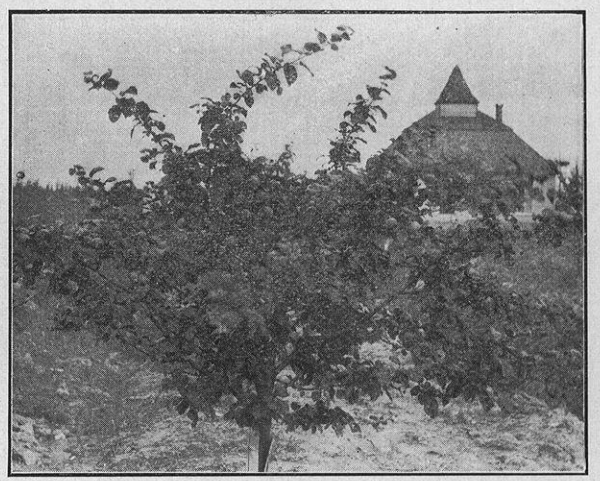
POSSIBILITIES FOR COMMERCIAL FRUIT GROWING IN WISCONSIN.

E. P. Sandsten.

In the past I have been somewhat sceptical as to the outlook for commercial fruit growing in Wisconsin. This early impression I gained not only from the discussions in this Society, but from actual observations in the state. A great deal of emphasis, I might even say too much emphasis has been placed upon the all-absorbing question of hardiness. In fact, this nightmare has so overshadowed all other factors in fruit growing that many of us have been unable to properly appreciate many of the advantages that Wisconsin really offers along many lines of commercial orcharding.

Why did the early pioneer fruit growers in the state fail, and why are we reminded in and out of season of their failures? A little reflection I think will clear up this subject and forever banish this nightmare of failures which has hung over us so long. First, we should bear in mind that these early fruit growers like all the early pioneers, settled on the prairie or open land where there was no original tree growth. This very fact is a sufficient cause for failure. Trees accustomed to more or less sheltered conditions, or at least to a broken or rolling country will not succeed on the open prairie. Take the mountain ash for example. This tree is a native of Northern Wisconsin and is found wild on the shores of Lake Superior, yet it will not do well, if it lives at all, on the prairie of Southeastern Wisconsin. Hence it should occasion no surprise if many of the Eastern varieties of fruit trees should die under the same conditions. Even our native crab apple is not hardy on the open prairie, nor does the wild plum dug up from the wood and planted on the open prairie prove hardy. Further, even in the most favorable apple growing states there are locations where apples cannot be grown profitably. Why then should Wisconsin be an exception and why should we base the whole future of fruit growing upon the past experience of the pioneer prairie settlers. Their experience and accumulated wisdom, are valuable and good for prairie conditions and for

Wealthy apple tree in Poplar Orchard; planted 1904. Photo Aug., 1908.



A Hibernal apple tree in the Poplar Orchard; planted in 1904, bore over a bushel of apples in 1908. Photo Aug., 1908.

such conditions they have rendered priceless service. But even on the prairie land, the original conditions are being changed. With the settlement there has come the planting of shade and forest trees. Buildings of various kinds have been erected and the old windswept conditions are gradually disappearing and with them a new era in fruit growing will develop.

Perhaps this question of hardiness has done some good in preventing a promiscuous planting of eastern varieties which, as we all know, will not live in many sections of the state, while on the other hand, it has led to excessive experimenting with worthless kinds and a great mixture of varieties.

In spite of the wholesale condemnation of eastern varieties, there are localities where many of these so-called "tender" varieties can be grown with success and profit. Our failures have in many cases been due to lack of good management, to proper methods of cultivation, pruning and spraying, together with poor judgment in the selection of varieties of trees and to site and soil. I am convinced not only from our own experience at the Experiment Station, but from actual observations all over the state, that commercial orcharding can be made as profitable and safe an occupation in Wisconsin as anywhere in the United States. I make this statement with the full knowledge of the marvelous results and profits obtained in other apple-producing states. These statements are backed by facts and not by fancy. Every year, many car loads of summer and fall apples are shipped into Wisconsin, especially into northern Wisconsin from the east and from the west, and sell at prices that are considerably higher than obtained anywhere else. I have a record of one of six car lots of crab apples shipped into Superior and Duluth from Montana, and selling at wholesale for $1.25 and $1.50 a bushel. Think of it! What a gold mine this would be for our own growers! The extra profit received from the difference in rates from Montana to these points would make a large item. Further, large quantities of Michigan fruit is yearly shipped into the northern half of the state at good profits. Now, no one can deny but what crab apples and summer and fall apples can be grown in Wisconsin, and be grown with success. As for winter apples, we can well afford to let them alone for the present, but even in this, we can be dangerous competitors with other states. When we can grow apples like the Wealthy we can also provide for

the cold storage so that these can be marketed during the months of December and January, and thus compete with the eastern apples that are shipped into the state. Further, it is recognized among eastern fruit growers that the Wealthy apple is equal and in many cases, superior to the standard winter apples of the east. In fact, the Wealthy is now planted extensively in the east, and is recognized to be the leading fall variety. Further, large quantities are held in cold storage for the winter market, selling at prices equal to the best. One single grower in northern Maryland has 100 acres in Wealthys. If we could confine ourselves to a few standard sorts, and build up a reputation with these sorts, we would make a great advance as a fruit growing state.

After travelling over this state for a number of years, I have become convinced that we have several sections that are admirably adapted for fruit growing. These sections are in many cases not continuous, but are isolated and are the results of topography and geographical location. One would naturally suppose that the best fruit sections would be found along the border of Lake Michigan, and this is true, providing the elevation is sufficient and the character of the soil suitable. There is no question but what apples, plums, and cherries in great varieties can be grown in this section, providing as I have said, that the elevation is sufficient and the character of the soil favorable. Further, there are local conditions in practically every county in the state where large fruits can be grown with profit, possibly excluding those counties and sections of swamps and low sandy lands, and possibly excluding the most northern portions excepting the Bayfield peninsula, but even in these sections a few varieties can be grown. Apart from these there are marked fruit regions, for example the section in and about Baraboo including what is known as the Baraboo Range, and westward into the counties of Richland, Vernon and Crawford. This section is perhaps one of the best fruit regions in the state, and it is only a question of time before commercial orchards will be dotted all over. From my own observations, I am convinced that even the despised Ben Davis apple can be grown successfully in this region. In fact, some of the best specimens of the Ben Davis apples and apple trees I have ever seen were grown around Baraboo. Further, we have to the southwest of Madison a large territory composed

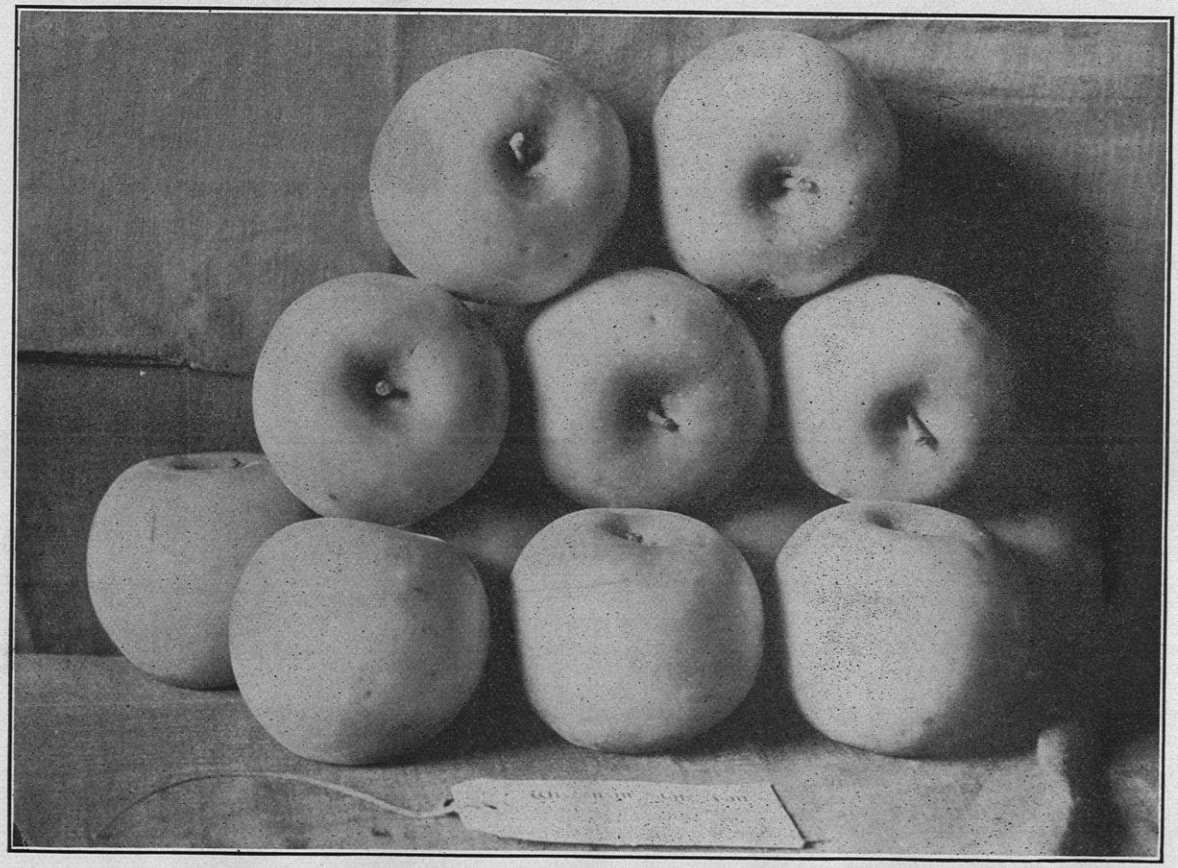
of a broken country that has numerous fine sites and locations for commercial orchards. In fact, these lands are better adapted for fruit growing than those farther south, especially in view of the fact that the southeasern counties are more of a prairie nature and trees planted on such lands are subject to winter killing from the effects of the dry winter weather, while those on a higher elevation and in a broken country are not so exposed.

Perhaps we are more interested in pointing out in where we fail in commercial fruit growing in Wisconsin, though this subject has been discussed scores of times, still like all good things, needs repeating.

First I would say that our failures, apart from the lack of proper orchard management, selection of soil, have been due to indiscriminate planting of varieties. The truth of this statement can be verified in practically every orchard in the state, large and small. Take almost any of our large growers in the state, and hardly one of them can fill a reasonably large order of one variety of apples. This fact prevents the grower from getting into the big markets, and thus he is unable to make it worth while for the buyer to take hold of his crop. No commercial orchard can be a success when it is composed of a score of varieties. To be sure, many of these orchards were planted as an experiment, but is it not time for experimentation to end so far as the grower himself is concerned? I think it is. The Horticultural Society and the Experiment Station can tell very accurately what varieties are adapted to the state, and they can also tell what varieties are the most profitable to grow. Further, the average farmer and fruit grower is no experimenter, nor can he in most cases afford to plant an experimental orchard, as experimental orchards as we all know are not money producers. Further the expense of handling a mixed orchard is considerably greater than one of few sorts, not only in spraying and caring for the orchard, but also in picking and packing.

Another important cause of failure is the universal practice of setting the trees too close together. There are very few orchards in the state where the trees are set sufficiently far apart to permit of easy cultivation, and to provide a normal and full development of the trees. Trees set too closely are not only more difficult to cultivate, but are more subject to the attack of insects and fungus diseases. It is more difficult to spray

the orchard, and when the trees are growing close together, they produce too much shade to properly color up and develop the fruit. Further, the fruit grown is small and inferior. There is not enough circulation in the orchard, and fungus diseases thrive under just such conditions. The proper distances to plant apple trees in Wisconsin is from 24 to 30 feet apart. Many growers argue that this is a waste of space, but few of our varieties will stand closer planting if the trees are going to produce a maximum crop of first-class fruit. Again, our farmers and fruit growers do not plant the right type of trees and the nurserymen are to blame for this. The tree that is the most economical for the nurserymen to grow is not always the kind of tree that the grower ought to buy. The nurseryman aims at size rather than at form. In fact, our fruit trees are sold by the calibre or size regardless of the shape of the trees. By this method, the nurserymen can grow a larger number of trees on a given area than he could if he grew ideal fruit trees which require about twice the amount of space. Again, the fruit grower is to blame for buying these poor trees. He is also to blame for endeavoring to obtain fruit trees at the lowest possible price. This is a wrong idea. It is not the original cost of the tree that makes it a valuable or poor tree. When a farmer pays ten or twelve cents for a tree he gets a tree worth that amount, but such trees will never make an ideal and profitable fruit tree. It would be money in the grower's pockets if he would pay twenty-five or even fifty cents for trees that have the desired form and size, for the first cost of the trees is very small when we compare it with the results that we are to obtain from the trees during their whole life time. It is vitally important that the grower should bear in mind that when he pays a low price for trees he gets cheap trees that are really not worth planting. Nursery agents and advertisers of cheap nursery stock are doing more harm to the development of profitable fruit growing in Wisconsin than almost any other factor. There are grades of fruit trees as well as there are grades in every commercial product, and if we do not start aright in orcharding, failure will be written over the future orchard. What we need in Wisconsin today is an application of the fundamental horticultural truths, rather than conducting experiments and discussions of subjects that have only a



First Premium Northwestern Greenings at Wisconsin State Fair, 1908.

secondary bearing upon horticulture and horticultural practices. We have accumulated facts and experiments enough to enable any intelligent person to start in commercial fruit growing or fruit growing for home consumption in the state. What we need today is an application of what we really know rather than branching out for other things.

DISCUSSION.

Mr. Geo. J. Kellogg: I am glad the Professor is converted partly, I hope he will be converted more and I wish he would describe that model tree that is worth fifty cents.

Prof. Sandsten: I said a fruit tree or a plant is as much an individual as an animal, and because you can buy one cow for $15 is no reason for saying that a cow is worth $500, but those people that buy a cow for $500, make more money than the person that buys one for $15. That is true of apples. If you cannot get a good apple tree, do not plant any, and if you get a good apple tree, the right size, right shape and right growth, it is worth fifty cents, if it is worth anything.

Mr. Hager: These reports of ours go broadcast, and I would like to get something more definite. Thousands of our reports go out to people who anticipate planting and are planting trees, and I am afraid they are going to get the idea from this that they ought to pay fifty cents for a tree. I wanted to bring out something a little more definite. He has not specified what kind of trees we ought to have. Maybe when he tells us that, what kind of tree we ought to plant, we will agree, and the planter will agree that he ought to pay fifty cents.

Prof. Sandsten: I had pictures with me and expected to throw them on the screen and show you an ideal apple tree, a tree that is worth fifty cents. I do not mean to say that trees sold under present conditions—and bear in mind, I do not blame a nurseryman for selling trees at fifteen to twenty-five cents, that has nothing to do with it, because the nurseryman will sell what he has to sell and what a farmer is willing to

stand for, but I mean to say that a good, ideal tree, such as I would have shown you if I had the lantern, is worth fifty cents if you have to pay that for it, but if you can get it for less, so much the better, but in proportion to paying ten cents for a poor tree, a good, ideal tree is worth fifty cents.

Mr. Geo. J. Kellogg: I wish to call on Mr. Palmer to specify what kind of trees he has been planting.

Mr. Palmer: I do not believe that it makes any particular difference whether we pay 50 cents or 15 cents for the tree, it is the tree we want. I have bought trees for considerably less than 20 cents that in my judgment were a great deal better than the trees that I have seen sold in my neighborhood for 35, 40 or 50 cents. The tree is what we are after, and not the price. I would not hesitate to pay almost any price to get the tree that I wanted, but usually, as far as my judgment goes, the trees that are sold for the highest price are really the poorest trees. In our section we can buy trees, if we know what we want, for a reasonable price, while the ordinary agent that comes through our country selling trees for 35 to 50 cents is just selling the usual trash.

Mr. Tippin: We have been through this very trouble in Missouri that you find yourselves coming up against in Wisconsin, and I am afraid from some remarks that are being made that the wrong impression may go out. I speak from an experience of twenty years as a propagator. I discovered a great many years ago that statements made by horticulturists and horticultural societies were taken advantage of by the tree sharks, and I dare say if there should happen to be any here now, that by next spring you will have among your tree sharks those that have got a specially propagated, patented, trademarked tree that has all the elements in it that you want, and it is worth fifty cents and you pay for it. This Horticultural Society, in my judgment, cannot do a better service than to educate its members as to what a No. 1 tree is, and also to illustrate how first class or No. 1 trees can be propagated, the importance of following up the better strains of the different varieties, and if it will not take too much of your time, I will give you my idea of a No. 1 tree, and understand, that it is not

based upon the theory that it has got to be grafted on some foreign stock, grafted in some peculiar way, or brought about under some peculiar mystery. A No. 1 tree is a tree thrifty grown, with well balanced roots and with a well balanced head. In my country, a No. 1 two-year old tree should be five to six feet in height according to variety, some higher; it would be of a caliper of 5-8 to one inch, according to the variety; it should be equally balanced, and, above all things, see that your tree when you buy it has a well balanced root system, not all the roots thrown out upon one side or the other, or out of shape. The greatest trouble comes from propagation, but in defense of your nurserymen who are trying to do what is right, I want to say this and then I shall sit down. I undertake to say, judging from my own experience, that the most conscientious nurseryman that you have in Wisconsin could send his men out ten, fifteen to twenty miles from his home to the trade, the custom, and honestly represent his stuff, and nine out of ten of you will say to him, "Well, I am thinking about buying trees in the spring, but I am close to the nursery and when the time comes, I will go and get them." He may not be out of sight of the farm when some fellow comes from Missouri or Michigan or New York or from the West or somewhere else, he has got something, some choice thing that your neighbor nurseryman has not got, it is propagated in a different way, it has some special merit in it, some special hardiness, and he is only passing, and before your neighbor knows it, he has signed his name to twenty-five or thirty or fifty dollars worth of trash, and in defense of the local nurserymen, I will say that his life is the hardest of any man on earth. I am out of the business now.

Prof. Sandsten: I did not say an apple tree was worth fifty cents if you can get it for less, but I will say it is better to pay 50 cents for an apple tree that is good, than to pay 10 cents for a bad one.

Prof. Sandsten then illustrated by means of the stereopticon the type of tree that he would recommend planting.

PLANTING ABOUT RURAL SCHOOLHOUSES.

DANIEL A. CLARKE.

This is the subject that has been assigned to me for a brief consideration. Now I should feel that I was doing a real harm to school ground betterment, if I omitted to speak of certain other matters relating to the schools. So permit me to call your attention very briefly to certain fundamental factors of good school grounds. First, the ground should be broad and large. There should be breadth of space for play, for instruction, and for all the features needed by the progressive school of the present. The house should be so placed as to secure the highest utilization of this ample area. The exact position will be determined by the peculiarities of each particular case. Yet we may safely say that it should not be located right on the highway nor in the very back of the lot. Some intermediate point will permit of nicer adjustment to the lawn, to the playgrounds, and the school gardens. Then the boundaries of the grounds should be marked. The space should be surrounded and framed. This enclosing feature, whether a fence, a wall, or a hedge, should be simple and dignified. Then the service and sanitary arrangements should be considered. Provision should be made to care for waste matters, such as, ashes, papers, and the like. There really ought to be no detached woodsheds or outbuildings. These ought to be provided for in connection with the house itself. If this is impossible, all such features should be carefully screened from view by planting. Where the space is sufficiently large, there should be a lawn. Though this should never be attempted at a risk of curtailing the ground to be used for the children's play. To playgrounds the greatest part of the whole area of the lot should be given. The size should be such as to provide adequately for the children's games. The surface of the playgrounds should preferably be of gravel and should be free from stones or rocks. Then the drainage should be good so that the grounds can be used for as much of

the year as possible. Every school ought to possess something in the nature of a school garden. Such gardens interest and educate the children, and if well planted and cared for, lend attractiveness to the surroundings.

Now let us discuss our subject proper, that of really planting about the school house and its grounds. The first question that confronts us is, where shall we plant? Usually the boundaries will need attention. There may be a call for protection against winds and storms, there may be need for screening unsightly features, and there is always the desirability of enframing the grounds. In the case of a given school, one or all of these reasons may hold good. These needs may be met in several ways. There may be a wind break composed of trees, there may be a hedge or there may be a mixed plantation of trees and shrubs.

Then about the house itself, there should be planting. Just as in the case of the dwelling, the schoolhouse should be connected with its site. There should be a harmony between the building and the ground immediately about it. This may be accomplished by massing shrubs against the foundation, or by training vines on the very building itself. Shrubs may be massed in the angles, around the corners, about protruding bays, and by the steps. The mass itself should be irregular yet graceful. Here the shrubs should come forward, there recede, here the lines should be continuous, there interrupted, while everywhere there should be a nice transition from the ground to the building itself.

There may be other occasions for planting aside from along the boundaries and about the building. This will depend upon the size and character of each particular school ground. It may be desirable to have shade trees, though care should be taken not to have too many of them nor to have them too near the building. These should skirt the grounds and be rather widely spaced. If there is a lawn, as there ought to be, in front of the house, we will want to plant shrubs and flowers about its borders. We should not spot it with flower beds nor clutter it with specimen shrubs. It should be free and open. If there is a school garden, this will have to be planted. There

should be spring bulbs and other hardy flowers, late annuals and autumnal perennials. Then of course there will be the grains and the vegetables. In all this matter of rural school gardens it is well to bear in mind that they should have a character of their own distinct from the city or the village school.

Now there remains the question of what trees, shrubs, and flowers we shall select. There are several possibilities. We may choose from the native plants, from those foreign or exotic plants which have proved themselves hardy and desirable, or, we may mingle varieties from both of these groups. This latter course would seem to be preferable under ordinary circumstances. So we will let our native trees and shrubs form the framework of our plantations, and place against this back ground the very best of the exotics. The native plants are comparatively inexpensive, are hardy and vigorous, harmonize with their surroundings and possess a decided educational value. The exotic should be used because they are showy, afford variety and make unusual appeals to us. In selecting varieties from these two groups, attention should be given to hardiness, to shape, to the period of bloom, and to the general attractiveness. It hardly needs to be said that for the school yard a shrub must be hardy and unusually vigorous. Then as far as possible, those shrubs should be selected which bloom during the school season.

Even with all these problems solved and the selection of plants made, to insure good results there must be a planting plan of some character. The real need is for a carefully thought out scheme of planting, no matter how simply it may be expressed on paper. Even if it cannot be executed in its completeness, there should be a comprehensive planting design. Yet even with this plan success is still uncertain. It must be carefully and intelligently carried out. The plants must be grouped on the ground in the same spirit with which they have been indicated on the plan. There must be a compliance with all those cultural facts which are essential to plant growth and prosperity. Then, after the plants have been set they must not be left to care for themselves. There must be a careful and constant maintenance of all the plantations.

DISCUSSION.

A Member: What trees would you suggest?

Mr. Clarke: American elm, sugar maple, varieties of oak, cut-leaf maple; but I think you want rather few trees and good trees, you do not want too many.

A Member: For smaller shrubbery, what would you introduce there, spiraea?

Mr. Clarke: Yes, spiraea Van Houettei, spiraea callosa, the Japanese rose, the lilac, but mostly the native shrubs.

A Member: Supposing you want to introduce a few flowers, where would you put them?

Mr. Clarke: I would put the flower beds against the borders.

A Member: What would you introduce for flowers in the schoolyard?

Mr. Clarke: Well, I would use some of the early varieties, plants like the Tulip, Crocus and Narcissus, those for the reason that they come early while school is in session, and then we might get some hardy perennials like the Iris.

APPLES IN MONROE COUNTY.

MR. FRED MUHLENKAMP.

We often hear the remarks of farmers that they are not going to have any apples at all this year, it is an off year. I think with the exception of a killing frost during blossoming time, or shortly after, the year, as a general thing, has nothing to do with it. What then, is it that causes the so-called off-years? It is over-bearing with some varieties, neglect, poor care, you might call it starvation with others.

Thirty years ago last spring I planted the first one hundred trees of an orchard of 1,000 trees; sixteen years ago I planted several hundred trees of which twenty were Longfield that

were planted in good soil, taken good care of and it was not long before they came into bearing and they bore every year, in fact they were overloaded. I said to my boys, "We will have to do something to those trees, fertilize them pretty heavily; if we should happen to get a cold winter it would weaken them so they would die." So we did, and twenty of these trees have not missed a crop; they were actually overloaded every year. Of course they told us we should thin them out, pick them out. I thought it was quite a task for the stingy cook to count the peas to put into the pot, but I think it is a great deal more of a job to thin the apples on the top of a tree twenty to thirty feet high, so when these trees were overloaded every year I asked myself, cannot there something be done to kill some of those blossoms during blossoming time? Three years ago last spring, seeing the killing effect of salt brine on vegetation, I says to myself, why not try to kill some of those blossoms during blossoming time, so I mixed one gallon of salt with eight gallons of water, went to work and sprayed a couple of these trees in full blossom and I tell you I made some hard looking trees. It killed the blossoms, we had an off year that year; it killed the leaves also, but they outgrew it again, six weeks afterwards you would not know the difference. Two years ago I took one gallon of salt to fifteen of water and found that a little too strong. Last year I took one gallon to twenty and found that about right. It destroyed the blooms and it did not hurt the leaves any. Now, some of you might think what is the use of spending that time talking on the Longfield, it is not a first class commercial apple, at the same time, take a Longfield, a barrel of good sized, well colored Longfields, and you have something nice, something to make sore eyes well to look at, and they will sell in our markets pretty close to the Wealthy, and they can be grown easier in Monroe County, any locality, than peaches, even easier than peaches. I have often called it the lazy man's tree, because there is no other variety known that will produce that much fruit with poor care, only the main fault is their overbearing. Of course it is not the Longfield alone that is troubled with overbearing; there are

lots of other varieties. If I were to set out an orchard again of a thousand trees, I should plant all Hibernal, and I will say now that I think there are but very few in the hall that will agree with me—and top-graft these Hibernal with a late and an early variety. I have got trees bearing which have been that way for years and I find them way ahead of all my other trees. When I first started to top-graft, a neighbor of mine coming from Ohio was interested in raising fruit, and he said "Don't you top-graft an early variety on a late. It will not do, it will kill the tree." But it is not so. The Tetofsky will grow with the Melinda on the same tree all right, but of course then it would take more tending to an orchard. As a general thing, the nearer we come to a winter apple, the better care the tree needs. It is no trick in our locality to grow summer apples, such as Duchess, Transparent and even the Longfield, but when you come to winter varieties, they have to have particular care, especially the old Walbridge and several others; by setting out an orchard and giving them about all the same care, there are lots of varieties that do not show up what they will do under good care. I find the Newell one of the most profitable apples I have got out of about thirty-five to forty varieties, but it takes high culture. If there are any questions in regard to this, I will try to answer them.

A Member: Define high culture as you understand it.

Mr. Muhlenkamp: I plow the ground, fertilize them pretty heavy every three years, sow it into clover again, as soon as the clover runs out into June grass, I plow it again.

A Member: What do you fertilize with?

Mr. Muhlenkamp: Barnyard manure.

Mr. Kellogg: Have you Patten's Greening?

Mr. Muhlenkamp: Yes.

Mr. Kellogg: How does that do?

Mr. Muhlenkamp: Pretty good, just the same as Northwestern Greening, does about the same in my orchard.

A Member: Have you the Windsor Chief?

Mr. Muhlenkamp: Only small trees.

A Member: Did you ever top-work a Hibernal with a Wealthy?

Mr. Muhlenkamp: Yes. I tell you why there is an advantage in top-grafting that way, you have all noticed by taking apples off the tree, by picking the early variety off that those left on the tree will grow very fast after part of them are picked off.

A Member: We grafted the Wealthy on the Hibernal and did not find the stock congenial. They all blighted. We tried it two years in succession and gave it up.

Mr. Muhlenkamp: I invite you gentlemen to come to my place next year and you can find the Wealthy on the Hibernal and all these winter varieties, trees large enough to grow six to ten bushels of apples and have been growing just as nice a tree as any in the State of Wisconsin.

Mr. Hager: How many varieties would you put in a commercial orchard if you were not going to top-work?

Mr. Muhlenkamp: Not very many. I should put in the Melinda, because the Melinda does not need top-working; I should put in the Northwestern Greening, but I would not grow it on its own root. It does not do very well in our locality on its own roots, it does very well top-worked, and the Newell, that is three, Salome is four, and the Wealthy. I think that is all I would plant.

Mr. Hey: I should like to know whether it is advisable to graft Grimes Golden on Northwestern Greening. Northwestern Greening does not seem to be an apple that is suited to our part of the country and we want to top-work them to something else.

Mr. Muhlenkamp: No, I would not. First, in that part of the State the Northwestern Greening dies on the roots; I spent two days traveling over that county this fall and looked over a good many Northwestern Greening that I had sold six or seven years ago and everyone I found was killed from the roots, and another thing, when they stand up high the Northwestern Greening has pretty brittle wood, the wind may blow the limbs off before there is ever an apple on it. I have two rows along the road that are up high and the wind has blown off a good many limbs before they ever came to bearing. By grafting

them onto the Hibernal, that is stopped, because no limb would come off the Hibernal; a cyclone might take the whole tree, but it never would blow a limb off.

Mr. Palmer: Then you let the top form on the Hibernal and then graft?

Mr. Muhlenkamp: No, I would graft them right off the first year after planting. You do not want to let the top grow first, you would lose at least two years.

MATHEMATICS IN HORTICULTURE.

D. E. BINGHAM.

Mathematics is that Science or class of sciences that treats of quantities or magnitudes. Horticulture is the art of growing and cultivating fruits and flowers, etc. And some may wonder why mathematics has any business mixing in Horticulture but I will mix it with the art of growing fruit only as a means of proving what can be accomplished.

It was my privilege this summer to visit the trial orchard located in Crawford Co. at Gays Mills. After looking over this orchard planted, in the spring of 1908, and finding only two trees had died out of 375 planted, and also noting the character of the soil and growth of the trees it occurred to me why not hundreds or thousands of acres of fruit on these fine ridges of Crawford County.

Our worthy Sec., Mr. Toole, and myself, while waiting for the train, were talking over matters pertaining to apple culture and we seemed to be all of one opinion, that we needed enthusiasm, faith, business fore-sight, energy, conviction and courage to carry out our convictions. It was then I said I could show by figures what an orchard could be made to pay.

Our Secretary concluded that I could build the largest air castles of any Horticulturist he had ever met so asked me to show for the benefit of the meeting how 100 acres of orchard could be made to pay.

Now I will take 100 acres of cleared land and 40 acres more on which to produce feed and pasture for the stock necessary to carry on this farm. It is a poor farmer who cannot make a living on 140 acres, so we will leave cost of labor out of the question.

The land can be purchased at forty or fifty dollars an acre, making the investment $6,000.00 or $7,000.00.

Add to this 10,000 fruit trees, planting at a cost of $1,500.00, and teams and machinery for $1,500.00 more, and we have a farm of 140 acres with 100 acres of apples at a cost of $10,000.00.

I will plant 100 trees to the acre using the Wealthy for sake of argument, other varieties may do as well, and cultivate this orchard for 5 years without counting any income from the trees, though of course, there will be sufficient to buy spray material after 3 years.

We now have a debt of $10,000.00, our farm in good shape and our trees at the bearing age.

All who have had any experience with the Wealthy know that it may produce 1 bushel of apples the sixth year after planting and counting one half the trees are bearing, the aggregate will be 5,000 bushels. These ought to sell, if well grown, from 75c to $1.00 per bushel net, making the sixth year sale from the orchard from $4,000.00 to $5,000.00.

Now perhaps many are saying that is too large and it may be so. And as we have 4 years before the orchard is 10 years old let us strike an average of $4,000.00 per year for 5 years making $20,000.00.

We had $10,000.00 cost on this farm, now we can pay that and take the other $10,000.00 and pay for our buildings, repairs, labor, etc., making the farm independent at 10 years and ready to yield an income to the owner that could not be realized in any other line of farming and the farm more valuable than one devoted to agricultural crops.

In Door County, my home county, 15 years ago fruit land or that land now used for fruit could be purchased for $10.00 to $20.00 per acre. But now after 14 years of demonstration the

price has gone up to $100, $150 to $200 per acre. And why? Because the problem has been worked out and proven.

The gross receipts from 8 acres of cherries for 6 years beginning the 4th year after planting was $10,700.00 or an average of $1,783.00 per year for the fruiting period of the orchard or $1,075.00 per year for 10 years, the whole time since the orchard was planted.

This was cherries, however, and as apples are under consideration I will confine my statements to apples.

In 1908 I had in orchard 1,300 trees from 10 to 12 years and they averaged about $1.10 worth of fruit per tree.

In 1907, the year before, 1,000 trees averaged $1.25 per tree.

But to obtain these results every year there are numerous problems to solve. There is the problem of distance apart to plant, of cultivation, of spraying, and of marketing.

The distance of planting whether to be 20 or 30 ft. must be determined. Here in Wisconsin where the winters are severe close planting has many advantages. You are doubling the income without very materially increasing the expense, a few more dollars invested in trees and a little more spraying—but very small items when compared with results. Wealthy apple trees will grow 20 ft. apart for 15 years without crowding. Then by careful pruning one can keep them from getting too close.

Cultivation also has a very important bearing on the profits. The manner of cultivation and expense involved. If there are tools that accomplish, by the aid of one man and team, the work of three men and team, better invest in the new implement and thereby accomplish the work in the shortest possible time. For often time is money on the fruit farm.

Now the problem of Spraying—How is a man to determine the profits of the spray. Perhaps the best way would be to take notes on an orchard not sprayed and compare it with an orchard where spraying has been thoroughly done and be careful not to form conclusions from careless or indifferent work.

For if the work is well done the results will be plain and the profits of the spray easily figured out.

The problem of marketing will solve itself if the fruit is well grown and carefully handled.

It is only by careful and thorough study and shrewd calculations that any business pays its profits and I can see no reason why thousands of acres of fruit land in Wisconsin can't be made to yield large profits to the owner.

DISCUSSION.

Mr. Geo. J. Kellogg: Would you confine yourself to Wealthy on that 10,000 apples?

Mr. Bingham: No, I would not, but I just took the Wealthy for the sake of argument. There are other varieties I think would prove fully as profitable in the orchard. The Northwestern Greening with me proves fully as profitable as the Wealthy.

Mr. Kellogg: That is the best thing I have heard of the Northwestern Greening this winter.

Mr. M. S. Kellogg: How many varieties would you limit yourself to, setting out a commercial orchard of upwards of 1,000 trees?

Mr. Bingham: That depends a great deal on my location. If I were to plant 10,000 fruit trees in Door County, I would plant largely the Snow, or McIntosh, apples of good quality, because I feel they are as much at home in Door County as the cherry, and we can grow them by careful work absolutely free from scab, and I see no reason why we cannot get a fancy price.

Mr. Bussey: You speak about the difference in appearance and cost of apples after spraying, can you get the full return of spraying by one season's work?

Mr. Bingham: I will give you one illustration. Two years ago this next spring I had occasion to buy a power sprayer, my orchard got too large for hand machines, investing $150; I invested $175 more in spray material and after those two investments I grew and harvested about $1,400 worth of fancy fruit. There are orchards in our locality where there are trees twenty-five years old to thirty, the average is twenty-five

years for the whole orchard, and there would be a large crop of fruit, but it would be impossible to get a No. 1 barrel of apples and the whole crop would be sold on the twenty-five or thirty acres for less than I would get from a fifteen acre orchard which was sprayed and taken care of, and the difference in the age of the tree is to be considered besides, our trees are about ten years old.

A Member: You had sprayed them right along, every year?

Mr. Bingham: Yes, we spray every year. Scab and other conditions can be controlled in one year without any previous work but the second and third year you would get better results than the first.

Mr. Muhlenkamp: Have you used arsenate of lead?

Mr. Bingham: Yes, I used last year about 800 pounds arsenate of lead and I think it is the best poison we can get.

Mr. Muhlenkamp: Do you like it better than Paris green?

Mr. Bingham: Yes, I would not use Paris Green again if I could get arsenate of lead.

The President: I should like to ask Mr. Palmer to repeat his statement made sometime ago in regard to the profit on some varieties.

Mr. Palmer: Do you refer to the spraying I did for my neighbor this year? There was a neighbor who had I think six apple trees, I was going by there with a spray pump one day and he came out and wanted to know if I would not spray his trees, I said, yes, if we could get it in his garden I would. He said, "I have never had an apple on those trees yet," he had been there about twenty-six years, and I sprayed the trees for him and then when it came time to pick the apples, he wanted me to handle the apples for him and he had from those trees an enormous crop of No. 1 apples, just for the one spraying just after they were blossoming.

THE NEWELL APPLE, ORIGIN AND HISTORY.

WM. TOOLE.

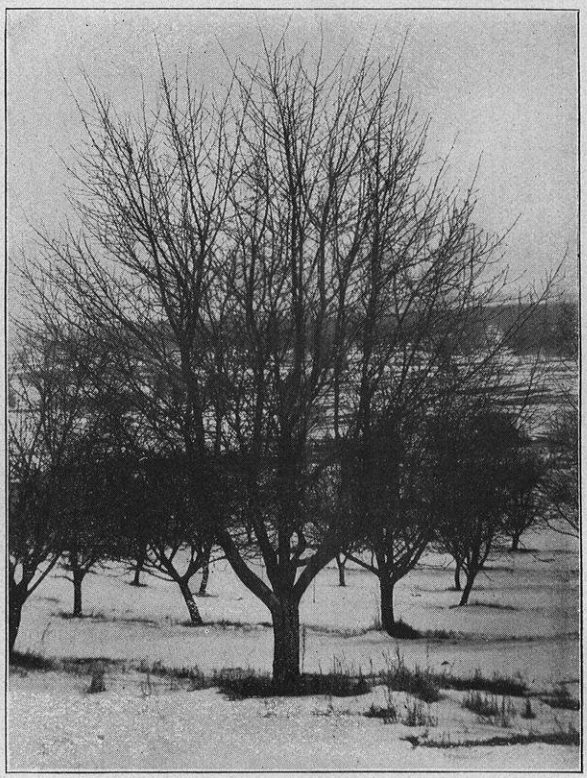
To be brief, the Newell apple which was formerly known for some time in this Society as the Orange Winter, originated from seeds planted by Orange Newell in the town of Fair-

field, about four miles north of the city of Baraboo. The seed was planted about sixty years ago, and I find, as is apt to be the case, that the younger members of the family have not paid much attention to these things, so they cannot tell much of the history. Remnants of the old tree are still in existence. Several years ago some part of the tree was blown off, it made new growth from the trunk; woodpeckers built nests in the trunk, and the branches have sprung up from that and have born several crops of fruit since the main part was blown off. The first time that I can learn when it was brought to the attention of the public, Orange Newell brought the fruit to the Sauk County Fair. That would be somewhere in the 60s, probably some forty odd years ago. Anyway, when the fruit was first shown in public it attracted so much attention that a number of different persons were interested. Charles Hirschinger was one, and I will say our old veteran in horticulture who is gone, Mr. Tuttle, was much opposed to it, as much as to the Northwestern Greening and others, as it was not one he brought out.

Gen. Sholes was much interested and was perhaps the first one to get scions and plant trees in Baraboo and help disseminate it. Also some men in Richland County, but Mr. Hirschinger tells me it was not much disseminated in that country. A time came when it seemed desirable to make a change from the old name of Orange Winter to Newell, because of the confusion likely to result as between this and Fall Orange, and it was brought before this Society about fifteen years ago. I think that is all I can tell you in regard to the history; others can tell you of the quality.

Dr. Loope: I do not know very much about the Newell, although I have it. The only question with me in regard to the Newell or any other apple is, is it a success, commercially speaking? So far as my experience goes, I have never seen any evidence that the Newell was a success commercially, I mean that it is not prolific enough.

The President (Mr. Toole): The next point under consideration is "Its Value in Commercial and in Home Orchards."



Newell tree in foreground.

A corner of the Medford Trial Orchard, with Supt. Harris viewing the new fence.

THE NEWELL APPLE.

J. S. PALMER.

The Newell Apple seems to be at its best on rather light soil well fertilized. The tree must be well pruned and top well thinned to get best results. It is always a shy bearer with a tendency to bear a medium crop each year.

The tree is very liable to crotch and split down with wind. The apple is of good size, rather uneven and liable to crack and deform.

It is a fairly good keeper and stands shipping well. It has no place as a dessert-apple but for cooking purposes it has few equals among our Wisconsin apples.

Its season brings it in the market about Thanksgiving time when there is usually a good demand for this class of apples. With me it has proved a very satisfactory market apple.

THE NEWELL APPLE—ITS VALUE IN THE COMMERCIAL ORCHARD.

A. J. PHILLIPS.

In my opinion the Newell apple has no value in commercial orchards. Mr. A. G. Tuttle told me so before I set it twenty years ago on soil similar to his. Reports from the farm where it originated are more favorable. It had quite a run for a few years after Prof. Goff said at a meeting in Washington that it was the best all-around seedling yet produced in Wisconsin. Some years before Prof. Goff's death with him I visited C. A. Hatch's orchard near Ithaca and he showed us a bearing orchard largely of McMahan and Newell and Mr. Hatch said "Had I planted all McMahan instead of part Newell my returns in money today would have been four times as much." I have planted it on its own roots and have it bearing top-grafted but so far I never had a paying crop.

The best specimens of the apple I have seen were exhibited at Minnesota in 1907 by A. D. Brown of Baraboo. The Newell is a failure at Wausau and in my travels I have never seen it in an orchard where it was a pronounced success as a commercial apple.

OTHER OPINIONS REGARDING THE NEWELL.

Mr. Bingham: The Newell, as I have observed it, for the last seventeen years is an apple that has no place in the commercial orchards of Wisconsin. The tree is the poorest of any of the varieties that are growing in the State with but very few exceptions. I have only grown it in a limited way. Of the trees I have, there is perhaps but one tree that is not broken down from the effects of winds or a moderate crop. As Mr. Palmer says, it is inclined to be an annual bearer, needs a great deal of pruning and the way it branches is so poor that a man has to be an experienced orchardist in order to keep the trees in shape so that a moderate crop will not break them down. It is not a good commercial apple, that is, on the market, it is not the right form, it is an ugly shape, inclined to crack and to be one sided, and the tree is a failure and the apple is of poor quality. The only good quality I know of is that it is a fair cooking apple, but it is a poor apple fresh and I think it has no place in a commercial orchard in Wisconsin.

Mr. Chapple: I want to say a word or two, as I have been an orchardist and nurseryman for a good many years, and have had quite a little experience with the Newell. It is true in growing a nursery we should be very careful not to let it crotch, keep the branches thinned in the young tree while growing and we can shape it so that there is no danger of its splitting down with wind, and it is an apple that sells well, if you keep it thinned enough. Mr. Tuttle said that the Newell was a seedling of the Perry russet, and I have always understood so. Now, this is my experience, and I think if it is properly grown in the nursery, that it is a very good tree.

Mr. L. H. Palmer: I have grown the young trees and I have had splendid success with the tree, it has grown well and I have got good apples, but as the trees get older they seem to be shy bearing. At first they bore heavily, but in our local market there is no apple that I raise that is in such demand

as the Newell Winter; people call for it and want it. It is a shy bearer as it gets older with me.

Mr. Muhlenkamp: I find it the most profitable apple I am growing. I have not missed a crop since they commenced bearing. It is inclined to split anyway, otherwise with good culture I find it by a good deal the most profitable apple I am growing.

Prof. Sandsten: Dr. Loope has just said to me, "it is a case of the old story, one loves the widow, another loves the daughter." So it is with an apple, one man likes it and another does not. If a man likes it, it does well; and with another it does not.

The President: To some extent it is the case also that with those who think well of a thing it is apt to do better for them. The Newell apple has the fault of the Perry russet and others, that it will wilt in high temperature, but there are many people like myself who think very well of it and like the peculiar flavor of the Newell, and like it as a dessert apple and it holds its condition a long time in the winter time if properly cared for.

The Secretary: Inasmuch as this discussion of the Newell apple must go on record, I think some explanation is due from members of previous trial orchard committees to explain why they selected it as one of five to plant in the Southern trial orchards.

Mr. Bingham: If that apple is on the list of trial orchards in Southern Wisconsin, it must be that the committee outvoted me.

Mr. Coe: If my memory serves me rightly, the Newell apple was planted, not in all the trial orchards, but in the Gay's Mill orchard, because it seemed to do particularly well in that section of the State. People who had known it and grown it in that particular section thought that it ought to go into the trial orchard there and that is one of the reasons it was put there, but in the trial orchards, as a whole, you will not find many Newell apple trees.

The Secretary: That is the explanation I was looking for, that clears up the situation. The Newell is not planted to any extent in any other orchard than the Gay's Mill orchard, which is in Crawford county, adjoining Richland county, where we

understood the apple originated and where it appears to do very well, in fact, it seems to be one of the best apples in that section of the state, in spite of all that has been said against it to-day and we placed it there as that was its original home.

Mr. Bingham: My first experience with the Newell apple was in Richland county, on the high ridges east of Richland Centre, and there in some localities the Newell apple did pretty well. C. A. Hatch had a good word to speak for the Newell, because he could grow it in certain locations, they were of fairly good form and the trees kept their shape and did not break down. Mr. A. L. Hatch whose farm was almost adjoining, had nothing good to say for the apple and he was always disgusted when he came around to that batch to harvest the crop, because he got a low percentage of No. 1s, the percentage I think would be about 25 to 40 per cent No. 1s, and the rest culls. That is my experience, and I have seen it in orchards where it has been grown for a number of years.

Mr. Geo. J. Kellogg: I do not know much about the Newell for bearing, in the orchard it is apt to blight unless it is on high ground and free circulation of air, and it would bother us in the nursery a great deal. It needs an extra amount of pruning in the nursery to put it in shape for a twenty-five to fifty-cent tree. Now, in regard to the keeping qualities of the apple, I bought two barrels of Mr. Hatch when he was in Richland county, I thought it was a nice winter apple and it kept until the first of November.

Mr. E. A. Smith: The Minnesota Horticultural Society at their meeting in December recommended this for trial in orchards in Minnesota. Our own experience, having tried it several years ago, was that it was not very satisfactory and we discarded it, but now that the Newell seems to be getting more or less in favor, we shall endeavor to give it another test.

The President: I will now call on our neighbor, Mr. George Tippin, Secretary of the Missouri State Horticultural Society.

Mr. Tippin: Mr. Chairman, Ladies and Gentlemen, if it is permissible to digress before taking up my paper, I will endeavor to impress upon you two facts in connection with the last two subjects discussed. The first thing to determine in the matter of pruning is what you are pruning for, whether

wood growth or to thin out your tree for sunlight and air or to induce production of fruit buds. This last discussion has forcibly brought out this valuable point in the growing of apples—know your soil. The Newell apple that you have been discussing may do well on a good soil and within one mile from that place may not do well at all. What is true of that apple is true of many others and many other varieties of fruits. As an introduction to my paper, Mr. Chairman, I believe I had better make a few statements. The paper is short and I am not going to say it is an important paper, but it is upon an important subject and I found it would be too lengthy to go into details, so I have undertaken to set out as forcibly as I could some of the most important reasons why co-operation in the marketing of our fruit crops is necessary, leaving the matter of detail to be worked out by local associations or societies and through discussion.

CO-OPERATION IN MARKETING FRUITS.

GEO. T. TIPPIN, Springfield, Mo.

The subject of marketing covers a wide range and many details and points of interest enter into its final successful consummation. The question of marketing is a most important one with the fruit grower. We are confronted with a condition and not a theory and one that must be solved if there is to be any profit in growing fruits, especially apples, and at the same time not forcing prices too high for the consumer by intervening expenses. How to do this is the question involved in my subject. There are obstacles in the way that must be overcome in the solution of the problem and conditions that must be improved. In discussing the subject of marketing, it is vitally important that the responsibility of all the parties interested be pointed out including the growing, the packing, the transporting, the distributing, the marketing. To start right, we as growers must not shirk our responsibility. We must grow good fruit before we can pack good fruit. We must pack good fruit in an honest way so that the marks and grades put

upon the package represents the contents, before we can become strongly entrenched in defence of our rights in consideration of all the elements and interest that must necessarily enter into the final analysis of the question of marketing. I cannot take time here, nor would it be proper to discuss how to grow and pack, but as these two are initiative points of great importance in the subject of marketing, they deserve the close observation and study of every fruit grower who expects to successfully market his fruit. In discussing the question of transportation and its relation to the question of marketing, I do not desire to create the impression that I believe all the rates are too high, or that as a whole, the railroads are charging too much, but that the fruit growers of the country are paying a rate out of proportion to other commodity charges. There is no reason why a shipper of apples should be charged double the rate that is charged on other commodities that are more perishable than apples and the average value per car more than double that of apples and yet this is done, and because of the perishable nature of our apples, which is plead by the railroad companies as a basis of excessive rates, we oftentimes have to ship in disabled stock cars and box cars with no doors and leaky roofs. In adjusting the question of rates, the most formidable obstacle to overcome is the power of injunction exercised by the Federal Courts to prevent State Officers from enforcing just rates within the States—I am aware of the awe with which the average man looks upon a criticism of the action of a Court, but it is not beyond the memory of men of my age, much less many of you who are older, when court decisions were rendered in the interest of a Bond System and extension of Bond territory, when the Bond was black and in the form of flesh and blood. Such decisions in favor of special interests proved the last straw. Today the Bond is white and written upon paper representing over capitalization of the great arteries of trade to the alarming extent that when a State, by any act of Legislature and an order of its Railroad and Warehouse Commissioners fixes a rate on fruit within the State, although more than double the maximum on rate commodities no more perishable and less risk, they are enjoined by the Federal Court on the ground that it is confiscatory and unreasonable. In dissenting from decisions of the Federal Courts,

we do so without criticism of the Court as an institution appreciating the far reaching necessity of this co-ordinate branch of our Government, but recognizing the inevitable truth that all men are only human and that a man, though sitting upon the bench, is subject to environment and associations with which he is surrounded and of which he becomes a part by contact. Such has been the history of the world. In that memorable debate between the Immortal Lincoln and Stephen A. Douglas, only fifty years ago, a supreme court decision was the main contention between these two great men, Douglas taking the position that a man had a right to his opinion and to defend the same before the courts but that when the court rendered its decision the individual or community should have no further rights in the matter. Mr. Lincoln said that the citizen or community's rights did not stop with the court's decision, if such decision was against the spirit of the constitution which guarantees to every man equal rights under the law and protection in the profits of his labor. Lincoln was a progressive, Douglas was a "Stand Patter." A real "Stand Patter," is the fellow who is looking after the interests of those who are unjust beneficiaries of unrighteous policies, consequently when the Missouri Apple Growers protested against paying the Railroad Companies 85c per barrel for hauling it 300 miles while the grower only got 60c per barrel for the apples picked and put on the table the Federal Court enjoins the state government from even reducing the rates so the grower would get as much as the transportation people. Some may argue that this does not come within the scope of the discussion of the subject of markets, but let us see. That there exists today an expense between the producer and consumer which must either force down the price to the producer to cost of production or below, or force up prices so high to the consumer that consumption is destroyed, no one will deny.

If the problem of how to reach across the span between the producer and consumer was solved as far as getting our products to a given section of the great consumptive body is concerned, and the price made to the consumer is beyond the reach of the masses, we have accomplished nothing in our own behalf, for the market is destroyed, but have contributed to the intervening unreasonable profits which are an estoppel to con-

sumption and thwart the very object we seek to obtain. So long as excessive rates on fruit products form a large per cent of the expense that make the reach between the producer and consumer unsurmountable and so long as we are charged 30% more on car lot shipments for a distance of 250 miles in the direction of our natural markets than we are for 1,000 miles in the direction our markets do not lay, I must contend that the question of rates and court injunctions enter materially into the discussion of this subject. Other obstacles are to be overcome if we are to reach the unsupplied markets or are to create markets by facilitating a demand among which are the unreasonable profits insisted upon by those who handle our products, especially our retailer, I am also aware that in discussing this phase of my subject that some one will differ with me if on no other grounds than the claim, we are antagonizing one business interest in trying to protect another, which claim is liable to be supported by the newspapers of the cities because the retailers are good advertising patrons of the press, but remember we are justifiable in pursuing any honorable policy to establish one business upon such basis and upon such relation to the trade as will insure a reasonable profit to us and at the same time place our products within the reach of the consumer at a price that is not prohibitive. If in working out our plans to reach the unsupplied markets and creating markets we are forced to run counter to some other interests, we do not do so out of a spirit of antagonism, but for self protection by applying the same rules of trade that are practiced by other large productive or manufacturing interests. We are only manufactures, and if we cannot manufacture our goods and put them upon the market at a price that will insure consumption, then we must quit. If we are not succeeding in doing this, shall we make the effort? Let me assure you that we have nothing to lose in the effort, for the masses whom we desire to reach will not be prejudiced against us in our efforts to get to them with our products upon a basis that will guarantee to us a profit so we can continue in the business of producing healthful fruits for their homes, at the same time allowing a reasonable profit for handling and not putting the price beyond their reach as consumers.

There exists today, between the grower and consumer of

apples, an expense that is prohibitive to consumption even when the price to the grower is only one dollar or less per barrel for the fruit. In August, 1906 the jobbing price of apples on the market was $2.25 per barrel in St. Louis. The retailer was charging 40c per peck or $4.80 per barrel, a profit of $2.00 per barrel after allowing 55c per barrel for shrinkage which is 25% of the cost price and a liberal allowance. In December, the same year, I made inquiry in another city of railroad men, of what their families were paying for apples. They said 40c per peck. At that time in that city the jobbing price was $2.25 per barrel. At 40c per peck, apples are a luxury to the masses. At 25c per peck, they are an available healthful food product and consumption would be increased ten fold. We cite another case in proof of this contention. During last winter at a certain town in Iowa, three retail stores were handling apples, retailing them at 50c per peck and did not sell an average of one barrel per day for each store, and that in a town of 1,200 people. A dealer decided to ship a car load of apples into this town. He got busy with the 'phone not only with the town people, but the farmers in the country, told the people that on a certain day he would have a car load of apples and would sell them at $3.00 per barrel. The car arrived and he sold 100 barrels in one day. Soon sold the car out and ordered several more cars. In my home town, Springfield, retailers charged that winter, 50 to 75c per peck for apples that cost them $3.00 to $4.00 per barrel and not one-fourth the apples was consumed that would have been if they had been retailed at 35 to 50c per peck, which price would have yielded a profit of $1.00 to $2.00 per barrel to the retailer and for which he should be satisfied. In justice to the retailer and in order to have his hearty co-operation in working out this problem, I again call to your attention the question of packing. The growers must put up straight honest packages. What ever grade of apples the barrel or box is marked it must be that, so the retailer will know that if he undertakes to handle apples on a reasonable profit that his profits will not be wiped out by shrinkage on account of poor packing. It might be well to add here too, that the retailer's shrinkage is often due to his keeping apples too long on hand by reason of his asking too great a profit. The people

of this country will consume as large a crop of apples as has been produced when properly distributed and at a price that will pay a reasonable profit to the handler, and $1.00 per barrel to the grower for the fruit on the packing table, and with short crops at better prices, the same with all other fruits. The greatest commercial achievements in this country for many years have been through organized efforts. In recent years the most successful fruit and truck growing and marketing has been in those sections of the country where organization is most complete. The old proverb "In union there is strength" applies with more force to no industry than it does to agricultural and kindred pursuits. The first essential in successful fruit growing is a proper knowledge of varieties and kinds adapted to the locality, and of the care and cultivation best to the soil to be planted. Second, a knowledge of the best methods of treatment to insure a perfect product. Third, a correct knowledge of the proper time and the proper way to gather and pack. Fourth, of the best methods of marketing, which in my opinion is most important of all. We may successfully grow, gather and pack and yet sacrifice all by not understanding how, or not being in position to profitably market our crops or products whatever they may be. By organization through which a community have all learned to grow and pack the same grade of fruit or to produce and put up the same class of goods, a greater inducement is offered to buyers and better prices can be obtained as a rule than by operating individually. I would be glad to see the fruit growers in every section of the country organized into local societies. The local organization could then be made the unit from which a more extended co-operative and concerted movement could be formed having for its sole object the proper distribution of our large crops. This, in my opinion, will be especially desirable and necessary whenever we have a general apple crop throughout the United States. I do not mean the formation of an organization to take charge of and sell the apple or other fruit crops of the country but that through a co-operative effort a plan may be involved that will be an instrument through and by which each association or individual can market their apples and receive the same benefits and at the same time have full charge of the sales of their products whether it be on the

track or in the market to which they have shipped. By organization and co-operative efforts the expenses of marketing could be minimized so that shipments of thousands of cars could be made to unsupplied markets direct, and be distributed direct to the people of the smaller towns and the agricultural mining and lumber districts, thereby cutting out the expense of at least one local shipment, also one or two profits. By organization and co-operative effort, this condition can be brought about, in my humble opinion. Through organization a power could be delegated to authorized representatives who would formulate plans to this end. I believe if it was put up to the jobbing trade in our large cities in a business like way, and they were made to realize that the producers must have some relief in this direction, their co-operation could be secured in regulating the matter of prices to the consumer. I would not want to antagonize the jobber or the retailer, and would recommend that an effort be made by co-operating with them to regulate prices on a reasonable profit basis. Failing in this, the only thing left to do will be for the apple growers of the country to establish apple depots or market houses in the large cities where the consumer can buy direct from the producer.

Through organization, the producer of apples and other fruits can incorporate into his business the same commercial methods that form the larger part of the success of most successful commercial industries of the country, and much can be accomplished both in reaching the unsupplied markets and creating markets to be supplied. Manufacturers fix the price of their products which they are enabled to do because they are well organized. The fruit growers should organize as far as they can. The strawberry growers are pretty well organized in the large berry growing districts. The peach growers of the South are making rapid progress in this direction. California and the North West is perhaps the best organized of any other section including the apple growers of the North West. Every county in the apple growing sections of the U. S. should have its local organization through which the matter of packing and fixing grades, the buying of packages and other necessary materials, the matter of rates, etc., could be looked after and by which you can command a greater attention of the buyer and in case you are not able to sell at satis-

factory F. O. B. prices collectively, you can send a man to the markets where individually you could not afford to do so. Just in proportion as strength is added influence increased and expense minimized by co-operation through a local association does it increase with its extension. The question of proper distribution which is a most important one in marketing our fruits when we have large crops can only be worked out through co-operation. If New York, Ohio and New England states were formed into a group, Iowa, Minnesota, Wisconsin and Michigan, a group, Indiana, Illinois, Missouri, Arkansas, Kansas and Nebraska, a group, and the North West or Mountain states a group, these several groups could be represented in an executive board authorized to perform the service for which such board is created. The compiling accurate crop reports, distribution and securing proper adjustment of rates would be a special part of their work. In case of short apple crops as in the past two years, this extended co-operation that I have pointed out would not be so necessary, but when we have general apple crops in this country, the value of its service would be inestimable.

DISCUSSION.

Mr. Hey: We are living in a town of about 10,000 inhabitants, with no fruit organization, and it is difficult many times for us to market our fruit, although the fruit grown there is in such small quantities that we do not know how to get an association started, and I am looking for information.

Mr. Tippin: It is very easy to organize your local people into an association. I had laid aside a copy of the by-laws of one of the first associations in our sections to bring with me, at the request of your Secretary, and forgot it at the last moment, for which I am very sorry, but I can give you in brief detail perhaps the most essential points in the question of your local organization, by stating the objects of it. In the first place, fruit growers organize into co-operative societies or associations for the purpose of facilitating markets and marketing their stuff. Now, take my home town, for instance, at

Springfield, we can market a great many berries in that town in our home market, but we found years ago that we were growing a surplus and we found when we marketed all our berries there, we got no profit out of it, so we organized a shipping organization, elected our board of managers and our secretary and our treasurer and when we have supplied our home market, we load the surplus in the cars, and by putting these all together, we could make up carloads and ship to the distant markets, thereby protecting the home market. Now, when we commenced, the manifests of the cars were made up and each man's berries were sold on the merits of the fruit in the home market and returns made to him direct, because we were not experienced in packing, and had not learned what we were able to learn through co-operation, but after we had been organized a short time, or a few seasons, we adopted our rules for picking, rules for packing, grading, everything is set out plain so that each one can understand, and the result is that we were soon all packing the same grade of stuff; the car load is made up and simply manifested as fifty crates, or 100 crates, as the case may be, and the car shipped and sold and the pro rata sales made back according to the number of crates they have, because on that point is is impossible for a commission house to sell a car load of berries made up of perhaps 150 shippers which has got to be sold from five to seven o'clock in the morning and keep an exact account of each individual lot. They do it the best they can, many of them, but they cannot do it perfectly, so you see the necessity of learning to pack your stuff at the time right, that is why I make the point in that paper, that one of the fundamental principles of solving the problem lies with us and we must not seek to shirk our own responsibility and lay it upon others. I remember I have packed apples in Southern Missouri in the fall when it was a little warm and apples were not first class apples, that I would have made an affidavit ten days later that I never saw those apples. That is the principal object of your local organization. One other point is of special interest that I simply alluded to, that is a matter of markets. For instance, that you have not an opportunity to sell your stuff on the track and you have got to consign it. Well, of you are working in a co-operative capacity, and you are not well established in the

markets and have not got your connections formed that you can put the confidence in that you would like to, it does not cost much to send a man up there where you are shipping it to to look after it. We know there are some as honest men in the commission business as in any other business, and also some of the biggest rascals in the world that are in the commission business. But that is not their fault, it is our business to look after our own business. The fruit grower must learn, that he must look after and attend to his own business. We are the most careless people in the world. There is not an industry in the United States representing such a vast amount of business and wealth as ours that is handled on such a slip-shod basis as is our business and we are victims of every scheme that comes along. Now, the quetion of selling on the track, which I simply referred to in the paper, encourages all men to grow and put up the same kind of stuff, put up the same grade of apples. Take a section in Wisconsin where you ship by the car load, if you growers stick together, buy your packages together, your fertilizers, everything else, you may make quite a saving in that. You do that and require every man to pack to a certain grade. You know a buyer who comes into your community will pay more for your apples on the track than I could afford to pay Smith and Brown and Jones or anybody else that does not know how to pack, or does not pack by any system, and these advantages multiply as you get into the subject and you will find it that way whenever you undertake it. I think I am justified in saying that in all the apple growing or berry sections, co-operation is the most important thing we can do. I really believe down in the south-western part of Missouri some of our associations sell all their strawberries on the track.

There is this question involved in the handling of strawberries that is not involved in the handling of apples, because apples are not so perishable and that is why we have differences of opinion in the great strawberry growing sections as to the best way of marketing the stuff; some are in favor of track sales, they say they will sell on the track at some price, others will not sell anything on the track. I just refer to the point that causes this difference of opinion. If berries are always in good shape, the weather is dry and favorable for harvesting

at picking time and they show good carrying qualities, it is not much trouble to sell in car lots f. o. b., because there is not too great a risk to be taken by the buyer, but if the weather is unsettled and we have too much rain, they are watersoaked and there is danger in their carrying qualities, the buyers will not buy them unless they can buy them way down below the point of risk. Now, the Association that insists upon selling to the trade during the good season, are at a disadvantage to the Association that consigns all the time—remember, human nature is alike everywhere. We have a commission firm, say in St. Paul, that has an account down there, an association shipping 100 cars of berries a year, this association comes with their berries straight along, they have a business contract, they expect their supplies to come from that association all the time, they start in the beginning of the season and they give that house its berries regularly, every day, regardless of conditions and price, as a result of giving the house the account while it is worth something to handle, when the deluge comes, the flood, and the berries are tender and soft, that house, if it is human at all, feels under obligation to put forth every effort possible to take care of those people under those conditions, and they do it. While, on the other hand, the association who has forced that market to buy when conditions were so they could do it, and the storm comes and then they are forced to consign wherever they can, they are simply put upon the market for what they will bring, they will turn them loose and get what they can out of them. I know of one firm in Neosha county last year, there came a wet spell, they at their own expense hired girls to re-sort every grade and help pack them in order to get enough out of them to pay expenses, if possible. They would not have done that if these berries had been consigned to them by an association that would not ship to them unless they had to, or shipped to them stuff of no account. That is a matter of detail for you to work out. I will say this,—if you will organize in your berry districts and in your apple districts along the lines I have suggested, it makes but little difference whether you sell on the track, or whether you establish your connection with responsible, reliable firms in the market and stay with them and make your grades and marks stand for what they represent, and you will succeed. I have no patience with

the idea of over-production and all that kind of stuff; the time will never come in this country when good fruit, properly packed, will not bring a profitable price.

A Member: The gentleman that just spoke seems to me made a wrong impression, if I got the right understanding; he said something about the retailers in selling apples, that in a great many places they get too large a profit and I believe he said in some instances that was something like $2.00 a barrel. Now, he spoke of getting apples by the carload and selling them out by the peck. Now, of course every one will understand that it costs more to sell those apples or that fruit by the peck than by the barrel. Now, the question is, is that generally the case that there is that much of a profit made in retailing apples throughout the country, are not those very rare cases?

Mr. Tippin: No, sir, that is generally the case, that is general all over this country.

Mr. ———: Well, I am in the business myself, I am interested in this. Now, what is the best thing for a merchant to do? Is he to buy from the grower to get his apples at the right price so that he can retail them at the price you name, or can he do it just as well through the commission house?

Mr. Tippin: That is the point I will say we are going to work out. It is simply this, if the jobbers, that is, the wholesale men, are willing to co-operate with us, and I am satisfied they are, because I have carried this investigation to some extent, they will go to the retailers, and say to them that this expense between the grower and the consumer has got to be reduced, and it is up to us to do it, now, if you are willing to take this stuff and handle it at a reasonable market price, we can continue to handle this stuff in a wholesale way, but if you are not going to do it, the growers will get together and shut us both out.

Mr. ————: Then somebody else must be making the profit, as far as my own experience is concerned. I am not so situated that we get apples from Missouri, most of our apples come from the East, from New York, but supposing the basis is $2.25 in New York, or $2.75, if we pay 75 or 80 cents freight at New York and lay the apples down at $3.10 and we ask $3.40 or some such thing, that would not be unreasonable.

Mr. Tippin: Oh, no.

Mr. ———: Evidently somebody is making a profit outside of the retailers. I believe it is the man before you get to the retailer that you want to get after.

Mr. Tippin: Take one case that I cited in Springfield, Mo., that was a year ago, in 1907, apples were very high, in the fall they started out at $3.50 a barrel f. o. b., the retail price was fixed at 50 to 75 cents a peck in the city and when apples went down in February and March, so that they could buy the same apples at $3.00 a barrel, they kept the retail price the same as before, and the result was that the market was destroyed and apples perished by thousands of barrels just because they demanded that unreasonable profit. As a general proposition, this condition prevails throughout the United States, and we as growers have got to take hold of the question ourselves, it has got to be solved.

A Member: That has been the case in our part of the State; we have looked into the matter quite often ourselves and we have always thought that the commission man is making too much of a profit.

Mr. Tippin: I will say this, and I have been in the trade ten years, the average profit per barrel for ten years for apples handled in the United States has been less than 50 cents a barrel.

Mr. ———: Well, of course, I want to inquire for information and if it is better to deal with the growers straight, why, that is the one we want to deal with.

Mr. Tippin: You misunderstood me, I did not intend to convey the idea anywhere, if you please, that the grower was to sell his stuff out by the peck to the consumer.

Mr. ———: You stated, though, that in fixing the price, to set it at 40 cents a peck and more people would buy apples at 40 cents a peck.

Mr. Tippin: If the jobber and retailer are not willing to meet us half way in this proposition in any way to get it in proper shape, we will get it to the consumer so he will buy bushel boxes and barrels instead of buying at 40 cents a peck, so that he can give his children apples.

The Secretary: Mr. Tippin, I want to ask a question or two. First, if you can tell us roughly what the price of apples

may be now in the wholesale market, Greenings and Baldwins, standard varieties, at what price they may be furnished to the dealers?

Mr. Tippin: St. Louis prices now are running from $3.75 to $3.50, good apples, according to the varieties, up to $5.00 a barrel, at St. Louis and Kansas City.

The Secretary: With all due respect to the grocers of Madison, I know most of them, and I am quite certain that they are honest men and not intending to cheat us, but the retail price of apples in Madison now is 60 cents a peck.

Mr. Hanchett: I have been very much interested in Mr. Tippin's paper and his talk. As President of the Sparta Fruit Growers' Association I want to say "Amen" to every word he has said, and I want to say that we have arrived at the point in our business experience where we feel that it is necessary for the different fruit growing sections to join hands on this proposition of transportation, also of getting the raw product to the consumer at the least possible expense. We have felt that with the city of Madison right near us, where we could not get the retailer to give us a price for our product which left any profit to us whatever, the consumer was paying for strawberries from 15 to 20 cents a quart throughout the season—that it was going to be necessary for us to put in a retail fruit stand in the city of Madison to handle Sparta fruit. We might not make it succeed, I have no doubt the retailers would jump on us, drive us out, but we would certainly be able to learn a little something about getting our product to the consumer, and I think that the method of taking it up with the jobber and through him with the retailer would be the more practical method, but as fruit growers, we must give the dealers to understand that we will not furnish them with fruit unless there is a profit in it for us, and that we want the fruit to be placed before the consumer at a price which will encourage consumption.

Mr. Burnham: I had a little experience in marketing apples this last fall with early apples, Yellow Transparent. I could not get an offer for them, our whole market was overstocked with windfalls, etc., selling at 25 cents a bushel. I packed Yellow Transparent that weighed about 42 pounds to the bushel and shipped them to Milwaukee, and they sold for

75 cents. That fall, when the Duchess came in, a man came over and wanted to buy, he said he would pay 80 cents a hundred for Duchess. This man wanted to buy Duchess and ship them to Minneapolis, in car-load lots, in bulk, to save barrels, he was paying 80 cents a hundred at that time. I would not sell mine and I packed them in small boxes, about forty pounds to the box, and shipped them to Minneapolis, and they sold for a dollar a box, readily, freight was rather high, about 41 cents, and the commission was ten cents a bushel. Newhall Brothers bought these apples from local dealers at 25 cents a bushel and I got at least 75 cents for mine by shipping to Minneapolis.

Mr. Tippin: Just one word on that point. Now, that meant to do something that every one of you would do if you were going out to buy anything, corn, wheat, cattle and hogs, he would buy it just as cheap as he could. Was it that man's fault? No, it was the grower's fault, because he was not posted. Now, if you will organize, and let me tell you, the best apple statistics gathered throughout the United States have been gathered through organization of the growers. It is better than the government report. I want to say to you that I, as a buyer, if I were buying, would rather employ the means I have at my command, than to take the government report of apple statistics. Through these organizations you have the means of knowing what the apple crop is and what the price should be, so when a man comes along and offers you 25 cents when the price ought to be 50, you ought to tell him that you are not ready to sell.

Mr. Burnham: Mr. Hatch, who had an orchard over on the East Ridge, in connection with Mr. Ries, sold his apples to a Madison man, I think he was a peddler, selling his apples from the orchard for $2.40 a barrel for No. 1s, and 25 cents a bushel for windfalls. They had some little trouble, they did not take the apples as fast as Mr. Hatch wanted to deliver them, so Mr. Hatch had to stop shipping any more, and he went to see how they came to Madison. Now, Mr. Hatch's was an old orchard and bore very heavily, these trees that bore at all, and there were piles of windfalls; he learned that when they came up here to Madison they were re-packed and the windfalls packed in with the others and sold in Madison for

$3 a barrel. This same man came to me, who had been getting Mr. Hatch's apples and wanted to know what I had. I had about 50 barrels of Wealthies and McMahan in the cellar; he said he would pay $2.25 a barrel. I would not sell them, because they were much better than Mr. Hatch's; mine was a young orchard and the apples averaged about one-half larger. I said, "How can you buy Mr. Hatch's apples at $2.40 and only pay me $2.25 for better apples?" "Well," he said, "I do not make my money out of the $2.40 apples; I make my money out of the windfalls." I afterwards sold those apples for $2.85 a barrel, and just as soon as they were gone the local dealers had to ship in apples right along.

The Secretary: I am glad that Mr. Burnham made that statement. I do not want to accuse the grocers of Madison of overcharging us; I am not sure that they do. I know nearly all of them and many of them are my friends; I know that none of them are getting very rich, I know every once in a while one of them fails in business; but I know on the other hand the growers of Wisconsin have gotten in the neighborhood of fifty cents a bushel for their apples, and we in Madison have to pay fifty cents a peck. There has been no time in Madison since September when apples have sold for less than 50 cents a peck and up to 70 cents a peck, and I know there are hundreds of people in Madison well-to-do, not poor people, but people fairly well-to-do, who cannot get all the apples they want. A man said to me the other day, "I suppose I am considered in fair circumstances, yet I cannot buy all the apples that I want to buy." I simply say there is something wrong somewhere; times are out of joint when those things prevail.

Mr. Pelton: I calculate we had better get out and hunt a market ourselves; that is what I have been doing the past thirteen years. I went and hunted my own market, showed my fruit and I sold my Duchess and summer varieties so they have netted me about 80 cents a bushel. I can get $1.05 a bushel for them at retail.

Mr. Tippin: I beg pardon for getting up again, because all this discussion is leading up to bring out the fact to manifest to you the necessity of co-operation on the part of fruit growers, and to take care of this gentleman, or two gentlemen who

are isolated so that there are only one or two in a county,—if in some section of any county there are two or three people, or over the county line there are three or four good growers that cannot have an association, whenever you have perfected your plans of co-operation in marketing, you can take care of those fellows, you can keep in touch with them by correspondence, tell them whom they can ship to in the market if they want to ship direct, or you can find a way to take care of them. One point on those different prices that this gentleman had on those apples. Speaking from ten years' experience in almost every fruit state and section in this country, I believe I will be justifiable in making the statement that he was caught on the hook of a high market quotation. It is lamentably true that the average man who has not gone through these experiences himself will be caught by a high market quotation and he ships his stuff and he gets nothing out of it, and he turns at once to the oldest old rule, you have got to blame somebody else for your own mistake, that is the whole thing in a nutshell. I will venture to say that nine out of ten of the growers of the country who have not gone through this experience that you have been talking about to-day will ship to a man who quotes a high market, whether he knows anything about it or not and when he gets his returns he brings himself to believe that he absolutely has done his duty, the other fellow is to blame entirely. That shipment to Milwaukee, no doubt that sale was a fraud. Now, it is to overcome those very things that we are talking about co-operation, those very things exactly. If you are organized and conditions arise that you have got to go into new markets and new territory through your collective organization you are able to send men there to look after your shipments if you have got to consign. Attend to your own business, like every other business interest; of course, gentlemen, we will find that these objections will come up, but things at last resolve themselves down to this, let us apply to our business the same business principles that every large commercial and manufacturing interest of the country do and we will succeed. We are going to run counter to somebody, we cannot help it, but that is not the question. Self preservation is the first law of nature and I contend that it there is any man on earth that is entitled to the profit of his

labor it is the man that applies his brain and brawn to the earth and brings forth that healthful fruit that blesses the Nation and makes health possible.

Mr. Smith: Which do you recommend, the bushel or the barrel package?

Mr. Tippin: That depends on the fruit. My opinion is that the bushel box is coming to stay and will grow more popular every year, and we will succeed better by packing our strictly No. 1 and fancy fruit in bushel boxes. Let me illustrate that, this is an important question. I cannot see any use in spending our time in learning how to plant, cultivate and grow all those things and then sacrifice all the profit when it comes to market. To-day the best apples on the market are bringing around $5.00 a barrel, that is what you call fancy apples, while fancy box stuff is bringing $2.50 a box, wholesale, that is $7.50 a barrel, therefore it resolves itself into this, the three boxes will not cost you more than perhaps two or three cents more. The question is, whether we will take $5.00 to illustrate, for a barrel of fancy apples, or get $7.50 at wholesale when packed in bushel boxes, that is simply an illustration, those prices will not always prevail, but the corresponding difference does prevail as a rule. Another thing, the disposition of the consumers is more and more to buy what they consume in the original package. This is manifested by the fact that almost everything that we use now from the grocery store is put up in packages that we take right from the shelf and take it home and that idea is gaining with the consumer of apples. There are lots of people who will buy a bushel of apples in preference to taking half a bushel or a peck out of a barrel that has been handled over and part of it left and thus encouraging the original package, and I think that is a good idea to keep in mind, to get the stuff to the consumer in the original package as much as possible. But it will depend on the quality, it will never pay to take what you will call orchard run straight, pack No. 2 in boxes, because the labor cost is too great.

Mr. L. H. Palmer: My brother and I have had considerable experience along this line. We have shipped from five to ten cars a year of apples; we make it a point to find a market; perhaps we will find three or four markets. We aim

to find the best one, we calculate to post ourselves as to whether that market is all right. We have been let down a little bit once or twice, but as a general thing we have succeeded in marketing our apples at the market price at least. It has gone that way, we have never found a place where we could not get rid of our car-load of apples yet.

THE ORCHARDS OF WESTERN NEW YORK.

PROF. W. J. HAMILTON, Two Rivers, Wis.

In a discussion of so broad and so well known a subject as the one assigned to me, it is impossible for one to give much in the way of new or startling information along the ever broadening lines of Horticulture. For this reason it is my purpose to merely mention a few of the features of tree culture common in the state of New York where I spent my boyhood and where as a farmer's son I learned many of the interesting facts of practical horticulture.

I am believing it is always a wise plan to make a comparison of methods along all lines. It is a well known fact that no one head nor collection of heads however wise can know and control all the wise and practical things especially in the applied arts and practical sciences. The nation and the individual who will learn from others with whom contact is made, is the progressive factor in our civilization. Hence I am hoping it may be wise for us to spend this short time in the comparison of eastern and western methods.

Unfortunately it is a common thing for people of the east to look upon the neighbors of the west as a certain unstable quantity while we of the west return the compliment by considering the farmer of the east as belonging to an ancient phase of civilization, scorning all things which make for progress. As a young man coming to Wisconsin I had great hopes of seeing the wild and restless Indians and had in mind the encounters with the timber wolves of which I had often read. And so today I find people in Wisconsin who look upon the

people of New England and New York as belonging to a class seldom, if ever, seen off the stage. A class of farmers and hill people who believe the earth to be flat and who are afraid of the cars. This is of course somewhat overdrawn but what I am trying to bring out is the fact that we as a people can gain much one from the other were we not to believe that our own methods and our own conditions are superior to those of our neighbors. The east can learn of the west when it comes to fruit growing as well as the west learning from the east. I would not presume for one moment however that it is a wise plan to adopt the plans and methods of eastern fruit growers to the western fields as every practical man knows that what may prove a great benefit in one section of the country may be a gross mistake in another section. The wise plan is to study methods and then adapt those most satisfactory from careful experimentation.

As to the fruit growing industry in New York, we are all aware of the fact that it is extensive and has been a major enterprise for a number of years. All temperate fruits grow there. Apples are undoubtedly the most important being about 50% of the product; pears and peaches following next with about 20%; plums and prunes 7% and quinces about 5% of the entire acreage. At the same time New York ranks next to California and Ohio as a wine producing state. As to California it is interesting to note nearly ¼ of the fruit grown in the United States comes from the orchards of this state while New York stands next with nearly one half of the total output of California. On the other hand New York leads in the production of apples followed by Pennsylvania and Ohio. This as I have said is interesting to note as we can readily see that the orchards of York state have played and do play an important part in the fruit industry of the nation.

However it is not so much the extent of the fruit growing industries in the several states that should occupy our attention at this time, so much as the methods and factors concerned in successful fruit farming. By this I also mean fruit farming for profit as well as for the pleasure we may find in the ever interesting employment.

I have often heard the remark that the opportunities for

fruit growing in Wisconsin were curtailed by the extremely severe climatic conditions. This is in part true but we must bear in mind that the climate of New York is also severe although there may not be the extremes in temperature so often met in our own state. The New York Orchardman has overcome to a great extent the disadvantages of the climate by a careful study of the vitality of certain kinds of trees and the most advantageous placing of orchard plots. In Wisconsin I find that often the matter of placing the orchard is never given a thought. The trees are selected too often upon the recommendations of nursery agents or others not well qualified. And the surprising thing to me is that this should be so in spite of the most excellent work that is being done by the Wisconsin State Horticultural society in advising and helping those interested in fruit culture.

In New York it is generally conceded that orchards are most successful when planted near large bodies of water; in the protected lands of valleys; upon elevated rolling land or at least in locations where good drainage is secured. It is also observed that orchards planted on the north slope of hills under the conditions which retard the blossoming in the spring and avoiding the late frosts which often ruin the entire crop.

As to the care of orchards after planting, I am believing that more attention is given to this matter in the east than in the west. The orchard is looked upon as a source of income of no small importance by the New York farmer and for this reason its cultivations is as important as is the cultivation of the corn or tobacco crop in the mind of the Wisconsin farmer.

For a number of years there have been different ideas as to the proper means of cultivation and all positions have been stoutly defended by men of judgment, ability and experience. As a boy I well remember the long line of argumentation in horticultural meetings upon the efficacy of various forms of mulching. In New York both the sod and dust mulches are used and some advocate the grass mulch. Undoubtedly marked success has been obtained by all methods as varying conditions demand varying methods of cultivation. Generally it is conceded that the sod fruit is of better color and has strong keeping qualities. On the other hand it has been found that the cultivated trees are more constant in bearing, they grow better

and are seemingly better able to withstand the winters. In my home county (Genesee) the open cultivation was continued until July and often into August. At a recent meeting of one of our county horticultural associations, a marked objection was made against the open cultivation of orchards on account of the washing of soil during heavy rains. In the east this is obviated in the use of cover crops usually rye, oats, clover or legumes. We were in favor of the clover from experience in the home orchards. Not only does the cover crop prevent the washing of the soil but it tends to hold moisture during the dry season and at the same time will hasten the drying in the spring.

The New York farmer is also considerate in the proper pruning of his trees. Among those who have given the matter considerable thought it is reported that the winter pruning increases the wood production while summer pruning tends to produce fruit. To one who has given the matter of proper pruning any consideration we cannot but regret to see so many young orchards in our own state of Wisconsin, failing to meet the expectations of their owners, simply through the fact that the young trees are strangled in their development through carelessness in or the entire lack of pruning.

The eastern orchardman differs from his western brother in another respect. He takes time for his trees to grow and mature before producing fruit. In this way he lengthens the life of the tree and secures a better quality of fruit. I realize that in Wisconsin the life of an apple tree is much shorter than it is in New York, yet I am not fully convinced that it is the best policy to force young trees in their production. In the east great care in transplanting is taken which is a matter of vital importance as you well know.

Various devices are resorted to in securing perfect and sound fruit. Spraying fruit trees has been a common practice in New York for many years and when carefully and scientifically done practically insures the fruit crop. We sometimes resorted to a method which I have not seen in the west, that is the use of the so-called smudge pots. This consisted in placing an iron or metal vessel in the lower part of the tree or on a tripod under the tree and placing within the same

coals and on the live coals corn cobs which had been dipped in pine tar. By allowing this to burn slowly forming a smudge which lifted through the tree practically the same effect as spraying was produced. In describing this at the Manitowoc County meeting, I was interested to learn from a gentleman present that he knew of the same method being used successfully by farmers in treating oats which were to be used for seed. The seed oats being suspended in burlap sacks in the farm store house for a short period and thus being thoroughly fumigated.

As to varieties of apples, when one takes into consideration the fact that there are about 1,500 different varieties of apples in cultivation it is useless to attempt to mention any in particular. Varieties which have been successful in New York will not always be the apple to plant or grow in Wisconsin and our own State Society has done much in determining the best varieties for the Wisconsin orchards.

I am believing that the older and standard varieties are the best and many of the newer varieties are more to be considered as novelties than anything of practical value. Those of us who were boys in Western New York can never forget the Red Astrachan, Golden Sweet, Yellow Transparent and Snow Apples among the earlier varieties while the Magnum Bonum, Northern Spy, Greening, Pippin, Russet, Spitzenberg, Baldwin, Winesap, etc. are the old time favorites among the later sorts.

PEAR ORCHARDS.

The pear orchards of New York rank fourth in importance. The trees commonly grown are commonly known as the Standard and the Dwarf. The latter is produced through grafting on quince roots. In planting the Standard, trees were planted from 18 to 22 feet apart while the Dwarf were set 12 to 16 feet. Some growers considered it a wise plan to run every fourth row in another variety to insure pollination.

In cultivation the pear orchards were handled in much the same manner as the apple orchards excepting that the nitrogenous cover crops are to be avoided on account of the tendency to woody growth and the prevalence of blight, the great enemy

of the pear tree. In all cases the trees must be carefully pruned and are expected to bear with profit from five to seven years after planting. In marketing pears much care must be taken to see that the fruit is picked firm, usually about two weeks before becoming ripe. If the fruit is left to ripen the well known grit cells are usually formed. In Genesee county the Bartlett and Seckle were favorite varieties.

QUINCE ORCHARDS.

In some parts of Wisconsin the quince tree and even the fruit is an unknown quantity. This is due in part to the fact that very few people have learned to properly prepare the sweet apple and quince preserves which were so well known and appreciated by every boy so fortunate as to have grown up among the quince orchards of the east.

The quince trees seem to grow under the same conditions as the apples but thrive best in the heavy, rich and somewhat moist soil. Two varieties were grown on our farm, the Champion and the Orange. The trees stood about 12 to 15 feet apart and were cultivated the same as the other fruit. The fruit always found a ready market and is a profitable one for the eastern fruit grower.

In conclusion permit me to say that I am believing the opportunities in Horticulture are just beginning to be realized in Wisconsin. Our farms are larger than many in the east and other agricultural pursuits conducted upon a large scale have occupied the attention of the Wisconsin farmer during the past. In the future as many of the farms of one hundred sixty acres are divided into smaller farms of eighty and even forty acres, fruit growing will be found more profitable than grain or general farming and while Wisconsin may never become known in the markets of the world as a fruit growing state as is New York or California, there are undoubtedly splendid opportunities especially in the production of the small fruits. In any event too much importance cannot be placed upon the careful and scientific study of the best methods in order to secure the best results under varying conditions. This I realize is being done right here in Wisconsin in the splendid work of our Agricultural College and the State Horticultural Society. The only thing that seems to block the way to early

realization of the plans of the College and State Society, is the unexplainable reluctance shown by some farmers in profiting from and by the experimentation which is being carried on in their interests. And this will be overcome some day and that they will mean the highest achievement of the Wisconsin State Horticultural Society.

DISCUSSION.

Mr. Geo. J. Kellogg: I wish to correct the impression that the Professor reports for all New York; it is no doubt a report from Genesee County all right. I know of a good many orchards in Chautauqua County where they use the grass mulch and mix in Canada thistles and burdock and they grow well. There is one orchard to which I sent down to last fall to get a barrel of apples, the man has about five acres of orchard, he could not send me a single barrel but what he was ashamed to send; the trees had not been pruned for thirty years and they do not spray at all, and spraying and cultivation is neglected all over the State more or less.

ARSENATE OF LEAD.

An informal talk by MR. H. M. ASHBY of Chicago.

The manufacture of arsenate of lead and the other insecticides is very complicated and very much involved, so that it will be very difficult to go into it here in a way that would be interesting, and as I am not a practical horticulturist, it is impossible for me to go into the spraying side of it with any advantage to you. Perhaps the reason that arsenate of lead was first used was the fact that Paris green, while it did the insect killing, settled so badly that it lost a great deal of its value in big spraying work. For a man using insecticides in a small way Paris green was very satisfactory, but when he began to use it in a big tank and big spraying outfit, it was troublesome, so the chemist and horticulturist looked around for some other poison, which would spray better, which would stand suspension better, and still kill, and among other things

they hit on arsenate of lead. They ran over the other various arsenate compounds and finally the consensus of opinion decided that arsenate of lead was the safest and most effective. To my mind you can make a comparison between arsenate of lead and Paris green in this way: Paris green when examined under a microscope appears like a hailstone, and arsenate of lead when examined in the same way looks like a snowflake; there you have the relative settling qualities of the hailstone and the snowflake, and if you examine Paris green under the microscope it is a perfectly round green sphere, a round ball; arsenate of lead has a soft, irregular, what we call amorphous condition, just like a piece of newly fallen snow, and for that reason it was very much better in our spraying mixtures; it settles very slowly. You stir up arsenate of lead and it takes about ten times longer to settle down into the same density, the same space as Paris green will and when it is settled down, it is very much easier to stir up, it never settles hard. Now, when you come to the making of it, there are a great many points which have to be observed. It is made from some form of lead, some soluble form of lead, either sugar of lead, which is lead acetate, or nitrate of lead, and arsenate of soda. Now, these two things are very simple at first sight, it seems very simple to dissolve these and mix them together, but a great deal of care has to be taken to get the mixture just right. All of you who have used Bordeaux mixture well know that for instance on the 4—4—50 formula you can slake your lime and then mix it with water, five gallons, and blue vitriol, five gallons, and you have a heavy precipitate that settles down quickly. Take the same mixture, dilute your lime to 25 gallons, and dilute your blue vitriol to 25 gallons, and pour them together, and you have a mixture that settles in suspension very much sooner than arsenate of lead when it is made. If arsenate of lead is precipitated from dilute solutions, it will never settle and never press into a small space as if thrown down and it will never make the solutions too strong.

Another advantage in the use of arsenate of lead over Paris green is the fact that it is safer to use; you can use it in very much larger quantities than you can Paris green or any other insecticide that is known. Suppose you want to use a very radical amount of any other of these insecticides, you have

run into serious trouble in burning foliage. That applies to Paris green or any of them, but arsenate of lead you can use under ordinary conditions in almost unlimited strength and you do not risk the burning of the foliage. That is another great advantage of this material. The company for whom I work make both arsenate of lead and Paris green, and we have a big Paris green business, but we have found that the general tendency among all our users is toward the arsenate of lead. I do not want to "knock" Paris green, because we make and sell a lot of it, but the arsenate of lead has a definite field which has to be worked out, and every manufacturer who is looking for horticultural business is working closely with the State and National authorities, because they all believe that that is the coming insecticide for big work, either orchards or any big areas. One of the early objections that we found to the use of this prepared arsenate of lead was that in the effort to give the consumer as much value for his money as was possible, it was pressed too stiffly and any man that has tried to work this heavy stiff paste into proper consistency has found it difficult and almost impossible to do so, and the tendency to-day is to prepare a very much softer paste with more water in it and let it go out on the distinct understanding that it is sold on the basis of actual arsenical compound. The idea is to buy it in the best condition to use, and then figure into the cost so much dry material which was actually present. In regard to the use of this material, in combination with other spray mixtures or fungicides, arsenate of lead can be mixed readily with Bordeaux mixture, but cannot be mixed with lime sulphur. The use of arsenate of lead with lime sulphur spray almost always results in a black precipitate, wherein the virtue of both the sulphur and arsenate of lead are lost, chemical reaction takes place which makes an injurious mixture, but the combination of arsenate of lead with Bordeaux mixture is very satisfactory. The Bordeaux is made up in the usual way, say the common 4—4—50 formula, and then use about two to three pounds of arsenate of lead, putting the arsenate of lead with the lime, there is no chemical action takes place between the lead and the lime, and when the mixture is completed with the blue vitriol, no action takes place, but if the arsenate of lead is mixed with the blue vitriol, then there is likely to be trouble; it is not very definite trouble,

but there is likely to be a little of it, but made up in the proper way, arsenate of lead gives splendid results with the Bordeaux mixture. I do not know that I have very much else to say except in regard to that bill; I have been present at the meetings; we are in accord with that bill and all the reputable manufacturers are very heartily in favor of that bill; they are very anxious to see a very rigid standard put up on these insecticides, because we all realize that more harm is done to our interests by harmful and injurious sprays which are sold under the names of good brands than anything else that can possibly be done. We know that we cannot put these insecticides out without giving good value for the money and if one manufacturer puts out an inferior grade, that hurts all manufacturers, so that the manufacturers would like to see a very strong endorsement by all State and National societies of this regulation and are thoroughly in favor of it. That new bill requires that arsenate of lead shall have 50 per cent dry arsenate of lead and less than three quarters of one per cent of soluble acid and in Paris green it requires that there shall be the usual amount of arsenate, I think it is either 50 or 55 per cent that it requires and less than 3½ per cent soluble acid. If there are any questions on this preparation of arsenate of lead, I shall be very glad to answer them.

Mr. Geo. J. Kellogg: I understand there is no danger of mixing it with the Bordeaux mixture when it is made.

Mr. Ashby: It must not be mixed with the blue vitriol, it needs the lime to protect it before it comes in contact with the blue vitriol.

Mr. M. S. Kellogg: I understand there is an injurious effect by using arsenate of lead before the union of blue vitriol and lime. Is there any injurious effect after the Bordeaux is completely mixed?

Mr. Ashby: I am not positive about that, but the chemistry of the thing would indicate that it was better to have the lime in combination or combined with the arsenate of lead; in case there is a little excess the other way it would be better to put the arsenate of lead with the lime than it would to put it in after the Bordeaux mixture was completed.

A Member: Does it take three pounds of arsenate of lead to a barrel?

Mr. Ashby: That is the approximate amount, the proportions vary, I have seen it used as low as a pound and a half.

Mr. Irving Smith: What is the relative cost of doing the same amount of work with arsenate of lead or Paris green to spray over an acre of potatoes or an acre orchard?

Mr. Ashby: That can probably be answered better by somebody other than myself, but from what I have seen of the thing and what information we have been able to dig out, the first cost is higher, but the final cost is lower. Arsenate of lead sticks better and there is not quite so much danger of its washing off and while the cost of the first material is higher, yet at the end of the year the final cost of the material is lower and the cost of labor is quite a little lower. That is the impression I have got from general conversation.

Mr. Palmer: I would like to ask if you could give us the relative strength of a pound of Paris green and a pound of arsenate of lead?

Mr. Ashby: The general comparison is 2½ to 3 pounds of arsenate of lead to one pound of Paris green.

Mr. Palmer: Which contains the more arsenical poison?

Mr. Ashby: It is difficult to say offhand, because in Paris green arsenic is present as an arsenite, three atoms of oxygen to two atoms of arsenic, whereas in the arsenate of lead it is present in the form of arsenate, five atoms of oxygen to two of arsenate, so I could not answer that offhand, I would have to figure it out.

Mr. Bingham: What per cent of arsenate?

Mr. Ashby: Arsenate of lead contains about 15 per cent arsenic acid and Paris green contains 56 to 58 per cent arsenious acid.

Mr. Bingham: Then in using 3 pounds of arsenate of lead to 50 gallons, that would be equal to about a pound of Paris green?

Mr. Ashby: Yes, about 2½ pounds is about the accepted amount, I believe.

BEST METHODS OF MANAGEMENT FOR WISCONSIN ORCHARDS FOR THE FIRST FIVE YEARS.

Mr. Bingham: The subject of orchard management has come up all through the meeting in different ways; we have had different discussions on the subject. Now, in regard to the management of an orchard for the first five years, of a commercial orchard, I can do no better than to give you the methods we are following in our own orchard. Locations differ and the different methods of cultivation have to be studied out with regard to your location, as Prof. Sandsten this morning said to you. If you are on hilly land, where the possibilities are of considerable washing, I would not advise cultivation as I would on level land.

In the first place, I would like to start the management of my orchard about one year before planting, getting the ground in good condition, planting a crop so that it is well prepared, putting on a good crop of clover and getting the land so as to have the trees growing from the start. I like to plant as early as possible in the spring and then give good cultivation. Now, the general opinion in Wisconsin is that we cannot afford to cultivate this orchard without any cropping and so we practice growing crops in the orchards. We rotate as much as we can and grow as many of the legumes as we can, we crop for ten years, but as this is for the first five years, I will say we grow a crop of beans. Now, if we are on land where the trees make a good growth, and we wish in our trees to make a good growth, we must crop accordingly. If we see our trees are growing too rapidly, we can put in into clover crop one year; as soon as a crop is cut, turn under and put in a second crop of clover. A crop of potatoes is a good crop for the orchard, beans and peas, rotating as much as we can to get a proper rotation, keeping the soil full of humus. If I can turn under the second crop of clover, then plant potatoes, take those off in time enough to get a cover crop of oats or peas—if they are taken off by the first of September we often get a very good crop of peas, that is about the plan I would follow for the first five years. There is another thing in regard to cultivation, if we do wish to cultivate the orchard without any crop, I would cultivate early

in the spring, giving the trees an early start, and the wood will be in shape to ripen up by the middle of July. Cherries especially will ripen after the first of July. For cover crops we use oats and peas. Now, it is necessary to prune annually and spray annually. If you have no crop of fruit, it is not any reason why that orchard should not be sprayed as thoroughly as though we had a fruit crop to protect the foliage; perhaps it would not be necessary to use as many sprays, but to spray in order to protect all the foliage we have, because there is the life of the tree, in a good healthy foliage. I think that would cover the ground for the first five years, that is the method of cultivation as we practice it.

Mr. Hey: You spoke of the cover crops of peas and oats, at what time do you sow that?

Mr. Bingham: Well, if I were sowing oats, a great deal would depend on the season. I would not want to sow them so they would get too rank a growth in the fall, and with the peas, they should be sowed a little earlier than oats, and if we are not growing any crops in the orchard, cultivate till the first of July, then sow peas and get a good stand. I like to sow a cover crop that dies down of itself in the winter, not rye; rye usually causes more work in the spring to get that cultivated in, but the cover crop of oats dies down, then you can put on your disk harrow and cultivate the ground thoroughly. In regard to the cultivation, we plow very shallow. I use a little gangplow, plow just enough to turn under this cover crop so that it does not clog the springtooth harrow, using that rather than the disk. The disk will not take hold and we oftentimes run over the orchard two or three times to get the results that we want. Now, by turning this over an inch or two deep, just enough to keep the plow in the ground, there is only a small square around the tree that is not touched and it gives a complete cultivation. That is one way we can keep the Canada thistles under control. Those tools are very convenient for that work.

Mr. Irving Smith: I should like to ask Mr. Bingham if corn is a good crop to plant where a young orchard is first set out? I remember seeing one where the trees were set, each tree taking the place of one hill of corn.

Mr. Bingham: I had six acres of that kind of orchard this year and I find that is not very successful. That was in cher-

ries, cherry trees planted in the corn field and there was some trouble with mildew on the cherry leaves by not having good air circulation, and a heavy crop of corn I do not think is a good thing for an orchard. I would prefer some of the lower grain crops.

A Member: What is the object of his cover crop if he allows it to be killed by the frost and does not turn it under when it is green?

Mr. Bingham: The object is just the same, we get the results from the cover crop, the benefit is not derived from the greenness, it is the protection given to the ground. If you do not have any snow, you will have less freezing and thawing of the ground than you would if it was perfectly bare, and the cover crop furnishes all necessary requirements and in its dead state acts as a mulch.

A Member: Does it fertilize the soil as much as if turned over green?

Mr. Bingham: I think everything is there that would be there in the green state.

A Member: You can sow crimson clover in the fall and plow it under in the spring, it would be better than oats.

Mr. Bingham: From my experience with crimson clover, I find it takes too much of the summer season to get crimson clover up to make much of a showing on the ground.

Prof. Sandsten: I hesitate recommending crimson clover for Wisconsin, because it often winter kills.

A Member: What does Mr. Bingham consider the most desirable crop for a young orchard?

Mr. Bingham: Well, if the soil is well adapted to the growing of potatoes, potatoes is a good orchard crop. It takes considerable fertility from the soil, but following that you can put in some beans or peas. Beans is a good crop in an orchard.

Mr. M. S. Kellogg: Is not there objection to trying to use crimson clover from the fact that it is rather hard to get a good catch and the cost of the seed, compared with the seed for an oats cover crop, is so high as to make the oats crop more valuable for the man growing commercially, and to cover the cost involved?

Prof. Sandsten: I think the oats is by all odds the best cover crop that you can use in this State. There are localities where we can use clover or peas, but as a crop for the average

A view in the Barron Trial Orchard Aug., 1908. These trees planted May, 1907.

Another corner of the Barron Orchard.

commercial orchard, it is undoubtedly the best cover crop we can use.

Mr. Bingham: That is my opinion, because it is pretty expensive for the man to get the seed supply of peas, it will take three bushels to the acre in order to get a good stand, and of course if peas are worth a dollar and a half per bushel, there is quite an investment for each acre of land, while with oats two and a half bushels will be sufficient.

ORCHARD MANAGEMENT FOR THE SECOND FIVE YEARS.

J. S. PALMER.

This orchard having received very good cultivation so far has made a vigorous growth. Now it should be large enough to begin business. The four cardinal principles of good orchard management are pruning, spraying, cultivation and fertilizing. Late in March or early April go over the orchard and remove all sap sprouts and unshapely branches, always holding the balance of the tree a little to the southwest. It is usually better to endure an unsightly or mis-shapen branch if large than to remove it, as great injury to the tree may result by very severe pruning, in fact most severe pruning should be done before the fifth year. Always cover all large wounds with wax or paint. When pruning wherever large limbs form crotches liable to split, the danger may be obviated in great measure by intertwining two twigs, thus forming a living brace. If this important matter were more often attended to in time many valuable trees might be saved that otherwise split down with the load of apples when fruiting really begins.

Spray just as green leaves begin to show with Bordeaux mixture 5–5–50, with 3 lbs. arsenate of lead added to each 50 gal. of mixture, then after the blossoms fall, spray again, using same quantity of arsenate of lead with Bordeaux 3–3–50 and again about ten days later with the same.

Plow and cultivate thoroughly in early spring and continue cultivation until June when oats may be sowed about 1½ bus. per acre with six quarts medium clover seed. Care should be

exercised in plowing to cause as little injury to the trees as possible. Use a slow steady team with low hame harness and short whiffle trees and do not plow too deep near the trees. In fact surface cultivation is all that is required. The spring tooth harrow is one of the best implements for orchard use and most cultivation can be done with it. When the oats are about ready to head, mow, allowing the crop to remain for a mulch, thus insuring a good growth of clover. This will complete the cultivation for this season. This treatment will check the growth and start the development of fruit buds. The next season spraying should be attended to as before and no cultivation will be necessary. When the clover is beginning to blossom it should be cut and if abundance of barnyard manure is at hand to maintain the fertility there may be no objection to removing this crop for hay, but otherwise it should remain on the ground. A second cutting will be necessary just before time to pick the apples, which may also remain.

The next season plow and cultivate in spring. When the oats and clover treatment may be repeated as before. In our climate subject to excessive heat and drouth in late summer and fall we should conserve moisture as much as possible through this season and I know of no better way than to keep the ground well covered with clover.

Heavy manuring may be done at any time except perhaps in September when such treatment may cause a late growth of wood which failing to ripen would be liable to injury by winter killing. Plowing late in October or November may sometimes be beneficial in destroying the larvae of the apple gouger and many other insects and seldom causes injury by freezing. Some of our best orchard ground is so hilly as to make continual plowing impracticable. Where this is the case mulching may be resorted to and very good results have been obtained by continued mulching. But if possible plow even if only a narrow strip between the rows, reseeding to clover as often as necessary to keep out June grass, timothy and other undesirable growth. Keep all stock out of the orchard with the possible exception of sheep which may be allowed at certain times to clean up all waste after picking and also in June to destroy the small apples and incidentally the young worms therein. Poultry are beneficial in the orchard at all times and a great aid in keeping insects in check.

The time has passed when we could set a few apple trees in an out of the way place, let nature take its course and get apples. Apple growing at present is a thorough going business proposition and like every other crop grown from the soil we cannot get a satisfactory results without intelligent effort on our part.

The President: Now, we will call on Mr. L. G. Kellogg.

Mr. L. G. Kellogg: It seems to me that the evidence in this matter should be produced by some one who has actual and practical experience. While I must admit that we have quite a large orchard, it is a great deal like Topsy, it has "just growed," and I will also admit that we have not given it that thought and care that we should to produce a commercial crop of fruit. I do not know that I can add anything that will be of value to what Mr. Palmer has already recommended. The second five years I think the orchard ought to receive clean cultivation with a cover crop up to the age of seven years of the trees and then I think that it ought to be seeded to clover to bring the orchard into bearing.

The President: It is now in order for questions to be asked or experiences given. There are probably others in the audience who might add something.

Mr. Bingham: I have one remark to make in regard to what Mr. Kellogg said, that the seventh year he likes to seed down the orchard to get it into bearing. We do the reverse. We like to cultivate our orchards to make them bear; we find an orchard in sod will not produce apples, but we give those orchards a little cultivation, and the first year after we start cultivation we notice our results, we notice a difference in the foliage, a difference in the growth of the tree, the health of the tree, it is so complete a change from a tree with little small foliage to one of vigorous healthy foliage, that the man that sees those things never would allow an orchard in our section of the country to go back into sod. That was demonstrated very forcibly in the Society trial orchard of five acres. The largest apple that I could get in that orchard under the sod system was six ounces, this year, with but one year's cultivation—that orchard was plowed last fall, a year ago, and cultivated this summer, clean culture, a crop of oats, a cover crop, and this

year, the same trees produced apples of eighteen ounces. The fruit buds were weak and small, and the foliage was very small, this year the foliage on the Northwestern was almost as large as your hand, perfectly green and healthy.

The President: I should like to ask if the reseeding, advocated by Mr. Palmer would meet with your approval?

Mr. Bingham: Not in my section of the country where we have the limestone soil. I think you would get better results by continued cultivation and only use cover crops as a method of getting humus into the soil, so that our soil does not get too hard and firm, and shallow cultivation. I think it is understood that most of the roots of a tree are within ten inches of the top of the soil. Now if we put a springtooth harrow in, or plow deep, we injure the roots, necessitating that tree putting out a new root system and that is the reason why, if we plow in the fall, we should plow shallow.

Mr. Riehl: One point might be spoken of here and that is that the modern orchard with us is very apt to become infested with mice, or what we call gophers, and I have seen entire orchards destroyed where they would get in under the mulch and girdle the trees right at the surface, or a little below. It is possible, however, that these pests are not known as far north as this, but with us it is a serious thing, and if we allow a mulch in the orchard, it is best to rake around the trees and draw some earth around the trunk of the tree, then there is little danger of there being any injury.

Mr. Pomeroy: This question of cultivation is entirely a matter of location and soil; I think in the region where Mr. Bingham lives, the practice he speaks of is the proper practice to pursue, while down in Houston County, Minnesota, where I have lived for fifteen years, as well as over in La Crosse and Trempealeau counties, among the high hills along the Mississippi river, where they have a whitish yellow clay with rock foundation, you would not dare to cultivate every year; you can there put a Duchess and Wealthy orchard into clover sod and raise large and fine colored apples, while if you plow it and cultivate it every year, you would get an excessive wood growth and get the trees to blight very heavily, and go to pieces by the time they are ten to fifteen years old. My brother has bought a place, and we have got 2,500 Wealthy trees on that place com-

A view in the Poplar Trial Orchard Aug., 1908, showing ditches for drain tile.

Crab apple tree planted four years at Bayfield, Wis.

ing into bearing and Mr. Harris, our neighbor, probably many of you have known Mr. Harris of Minnesota, has had an orchard there for thirty-five years, and it has been everybody's experience that it absolutely will not do to cultivate year after year.

Mr. Kellogg: I would not advocate sowing an orchard to timothy and clover, but to clover alone, but the second year I would cut that clover, utilizing it entirely to mulch the trees, the second year I would plow this orchard again and by cultivating in this way add humus to the soil. Upon most of our clay soils it is necessary to do something of that kind.

Mr. Hey: I would like to speak about one thing, if I understood Mr. Palmer, he says that a 5–5 mixture for spray is the proper thing, is that right?

Mr. Palmer: That is for the first spraying in the spring before the leaves are out, before there is foliage on the trees. The second spraying at 3–3–50.

Mr. Hey: In the Southern part of the State they advocate having as low sometimes as one pound of copper sulphate and two is common. They say the 4–4 spray is injurious and they cannot use it.

Mr. Palmer: There is great difference in varieties in spraying. We have some varieties that even a 3–3 mixture will injure. I have frequently injured Snow apples by spraying with 3–3 mixture, while other varieties of course will stand a stronger mixture, but I would never recommend stronger than 3–3–50 after there are apples on the trees.

Mr. Bingham: I think the great trouble with the 3–3, 4–4 and 5–5 is simply in the lime. I think we can make Bordeaux mixture, no matter what strength, and we will have injury if we do not have enough lime. We all know the lime in Wisconsin, is very poor. I use the 6–4 and I could use 8–6 and never injure the foliage, because the entire amount of blue vitriol is neutralized by the lime and you can put in any amount of blue vitriol if you use enough lime to neutralize it. We spray all varieties the same and we get no injury at all if we use the 3–3, but with the 4–4 we get injury.

Mr. Palmer: Can you spray Longfield without russeting?

Mr. Bingham: I do not believe in that russeting with Bordeaux mixture. We spray the Longfield thoroughly and we

find apples, some of them rusty and some that are perfectly smooth on the exposed sides of the tree where we have had lots of Bordeaux, and we have tried to soak trees with extra heavy spray, and we find our trees are free from rust. I think that it is a weather condition, I do not believe Bordeaux mixture russets apples. This year I used the 4–6 formula when the apples were two thirds grown. One of the last sprays we put on was a thorough spraying along about the middle of August and we saw some of it on the trees when we harvested in the fall and not any russeted apples. On the Northwestern Greening, especially, back of my barn where I was experimenting, giving them a thorough spraying late in the season to see what the result was on the late brood of codling moth, I found the apples free of worms, we would hardly find a wormy apple on the tree. In other sections of the orchard, where we did not give them the extra spraying, we found more wormy apples. Dig out that little red spot on the apple and you would find the codling moth in a small state, the egg was laid on the apple and they were eating in, you would not notice them at first, but as late as October when we were picking winter apples, we would find the red spots and by digging in we would find the little codling moth. Those go into the barrel and you wonder where those worms came from in the barrel, because you were certain you did not put any wormy apples in.

AFTER THE TENTH YEAR.

The President: We have now brought our orchard up to the tenth year and Prof. Sandsten will take charge of it from now on.

Prof. Sandsten: It seems to me when you get an apple orchard up to the age of ten years and in good bearing, that you have the whole problem solved and there is no use for me to dilate upon what has already been said.

The best thing, if the orchard is alive, when it is ten years old, which it sometimes is, is pruning, and when the pruning is done, I advise you not to use a hatchet or a crosscut saw. I prefer to prune before the sap flows, although a little after the sap has started is all right. I would spray every year, regardless of the crop prospect. I would make the first spraying be-

fore the buds begin to swell, or about the time the buds begin to swell. I would use about two to three pounds of copper sulphate and the same amount of lime to the 50 gallons of water. We do not believe in using more than 3 pounds of copper sulphate, because we have found that 3 pounds of copper sulphate is sufficient to prevent the fungous diseases from getting a start. Now, the apple scab spores light on the buds and if we do not spray, these spores will start to develop as soon as the buds expand, so you want to cover the buds with the spray to prevent the spores from germinating. Bear in mind that the spore is just the same as the seed. Then when the buds are about to open, we give the second application, and we use the same mixture. The third application we apply when the petals of the blossoms have fallen. We use the same mixture but to it we add from two to three pounds of arsenate of lead; this is to get the first brood of the codling moth. Now, the only reason for putting the lime in for the first two sprayings is to indicate where you have been spraying. We spray at least once more, using the same mixture of 3–3, together with arsenate of lead, or we use the 4 and 6 formula (4 of copper sulphate and 6 of lime.) I do not believe in the 5–5 formula, because, as Mr. Bingham has said, our lime is not pure lime, and for that reason 5 pounds of our lime will hardly ever neutralize 5 pounds of copper sulphate and an injury is done to the foliage and fruit.

After the spraying is done comes the question of cultivation. I would lay down as a general rule that an orchard should be cultivated and then we will modify this rule to meet the conditions of the individual grower and that is the only rule you can lay down. We have a portion of our orchard at the Experiment Station that has been in sod for a number of years. Of course it is rather steep, but let me tell you that anyone can go into that orchard at fruiting time and see the difference, not only in the vigor and health of the trees, but in the amount and quality of the fruit on the trees, and I do not care what the advocates of sod orchards may say or do I will stick to thorough cultivation and I think every progressive, up-to-date, successful fruit grower will do the same. (Applause.) I know a 900-acre apple orchard down East on a hillside, steeper than I have seen in Wisconsin, on which apple trees have been planted

that is cultivated in strips, and in a few years that whole hillside, or mountain side, will be terraced and it can be cultivated thoroughly. Further, I do not believe in sheep. They are all right, but I do not want them in the orchard. Give me the pig or hog of the right kind. He can get more grubs and insects than any other animal I know of, and he will do no damage, and then you have something to eat later on. Do not let him do all the cultivation.

The cover crops I would plant about the middle of July, and I sow oats. Clover is all right, but you want to look out, as otherwise you may get too much wood growth. You do not want to grow too much wood, you want to have fruit and as long as you have too much nitrogen in your soil, you will have fine looking trees, good growers, but you will be minus the fruit. I do not believe in raising crops of clover, and turning them under; the average soil, on which we grow apples in this State, has enough nitrogen in it, what we generally need is phosphoric acid and that you can apply according to directions that were given here yesterday. I should not keep on cultivating, if I found that the orchard was growing too rapidly, is producing too much wood, but should be inclined to seed it down for a year or two, only until the wood growth declines. I will tell you the reason for it. You know the tree has to get food supply in order to grow and if you have a covering on the ground of sod,—generally blue grass as I find in most orchards in Wisconsin—the air and sun is shut out, there is no decomposition of the materials in the soil, because the air cannot act upon it, the soil is stagnant, not aerated, and in such condition is not a fit home for the roots to live in, they have to have air like everything else that is alive. Further, sod orchards are more subject to droughts; an orchard in cultivation will stand twice as much drought that a orchard sod will, and that means a great deal in this state where we are subject to summer drought, and the droughts generally come in the season when our fruit is growing, and so the fruit needs a large amount of moisture in order to develop the proper size. I do not know that I can enlarge upon this any more; I think the subject has been gone over quite fully from the infancy of the orchard up to old age.

Mr. Geo. J. Kellogg: There is one question I want to ask

in regard to the spraying, would not you catch enough curculio to pay for putting in the arsenate of lead for the first two sprayings?

Prof. Sandsten: As a rule, yes. Now, let me tell you, that comes right in the line of cultivation, and a cultivated orchard is half as easy to take care of so far as disease and insects go as one in sod, because it is only half as subject to these things. Of course, if you have a "buggy" neighbor you are apt to get some of his animals, but in your own orchard if you cultivate and spray, the insect and fungous problem is so much less than it would be if you did not spray. Also in fighting insects and diseases, it is the first application, the timely application that counts. If we kill the first brood of the codling moth, the second brood will be very small and will not trouble us, but as it is in this State, the first brood is relatively small, but what a crop we have when the second one comes around, simply because we have not killed the first brood and if we only would have sprayed thoroughly the first time, we would kill out the parents of this numerous offspring that appear the second time.

Mr. Kellogg: Now, the varieties for a commercial orchard?

Prof. Sandsten: Let somebody else, whose hair has silvered in the service of horticulture in the State of Wisconsin answer that question. Mr. Kellogg is more capable and knows more about varieties than I do. If I should plant a commercial orchard in this State, I should not plant over—well I will say six varieties for summer, for fall and winter varieties I would not go to a list of forty or fifty, because if you do, you will not have a commercial orchard, except for nurserymen who want to grow scions it is all right, but for a commercial orchard I would not, and as to varieties, I will let Mr. Kellogg answer the question.

Mr. Kellogg: I am not a commercial grower. When I first set my orchard in 1854, I put out fifty varieties, and I will call on Mr. Palmer to give us his experience at Baraboo on commercial varieties.

Mr. Palmer: As far as my commercial orchard is concerned, it consists of about fifty varieties. Out of the fifty varieties I could pick out seven or eight that would include all the profitable varieties that I have ever grown in the orchard. Of course there is an occasional profit perhaps out of some of the others, but not worth considering in a commercial way. Grow enough of one kind so that you can have sufficient quan-

tity to place in the market to make it an object. If possible, grow the kinds together, grow one kind in a block, so that in picking and packing you do not have to travel all over the orchard. That is a great point. I, perhaps stick to some of the old kinds that I would hardly dare to recommend here, or recommend for all over the State. The Wealthy, McMahan and Northwestern probably are in the lead of anything we have now up there.

Mr. Kellogg: Only three varieties?

Mr. Palmer: I say those are probably in the lead, I would plant Golden Russets, Tolman Sweet, Fameuse, Utter, Plumb's Cider, these have been as successful with me as any I have planted.

Prof. Sandsten: It simply emphasizes the point that we are planting too many varieties, and if we only planted a few varieties, and if we had an orchard of any size, it would pay the commission man or fruit dealer to go into the orchard and buy a crop, but no dealer is going to buy an orchard of fruit when you have fifty to sixty varieties, he cannot handle them profitably.

Mr. Pomeroy: In New York, where a farmer has a great many varieties, the buyers call it the "succotash" orchard, and pass it by. At the Minnesota meeting the question came up, "What would you plant if you planted a thousand trees?" Mr. Edgar got up and said 999 Wealthys and then another Wealthy. I think that except for the Duchess, Wealthy and Northwestern Greening there is not very much of commercial value for planting.

Prof. Sandsten: I would not put it as strong as that, I think we have some very good varieties that we could plant and some varieties I would plant in preference to Northwestern Greening. What I mean to say is, select a few varieties and stick to those, but be sure you have the right variety for your own locality, and not because one man one hundred miles away from you is growing a variety successfully, do not plant the same.

Mr. Kellogg: I have been asked several times to name varieties for localities and I always say, "Look about and see what is doing the best on soil like your own and locations like your own and go for those varieties." I would not plant more

than three or four or five kinds. Newell was put on the list of five at the State Fair, we began to "use up" the Newell this forenoon, I don't know but perhaps we might "use up" everything else but the Duchess. Stickney used to say 99 Duchess and one more Duchess in a hundred. Duchess is all right and Wealthy is all right, I think McMahan is all right and Patten's Greening, but wherever these are a success, plant them, that is the rule.

Mr. L. H. Palmer: I want to say one word to Prof. Sandsten about the hogs. We put hogs in our orchard and the trees make a nice place for them to scratch against, they wear the bark off. Not only that, I have seen them gnaw the trees, pull them down. We keep them out, they kill a tree in two or three years.

Prof. Sandsten: I can only say there are hogs and hogs. I presume there are individuals of that type that would help themselves to some bark and who would feel inclined to relieve their feelings by leaning against a tree, but as a rule I found that even in a young orchard they are not harmful, but beneficial in picking up the wormy apples. I would put a piece of wire in their noses so that they would not be too obnoxious in getting down into the ground.

SHRUBS AND ORNAMENTALS.

E. A. SMITH, Lake City, Minn.

What kind of a picture shall the home and its surroundings present? First impressions are lasting and they should be pleasant ones.

The frontispiece and foundation work will be the velvety grass upon the lawn. The perspective and coloring will be represented in the arrangement of trees, shrubs and flowers. Here is a great opportunity for individuality to assert itself. No two landscape architects or individuals would equally approve of the same design. While tastes vary and different designs possess equal merit there are some designs which would be bad, just as there are some pictures which are bad, as colors and effects may be made to literally swear at one another.

In designing a lawn, the picture must be taken as a whole. Piece work cannot be made artistic. The pepper and salt arrangement of shrubs has had its day. The effective massing of shrubs and flowers idea, has come to stay. It is not the purpose of this paper to be arbitrary, nor to give detailed or botanical descriptions of various plants which may be suggested. These can be found in good catalogs, encyclopedias or in books pertaining to horticulture.

HARDINESS.

Without question, however, the one important thing to be taken into consideration in this Northwestern country, is hardiness, for no one cares to spend time and money in planting those things which will not stand the climatic test. We are, therefore, somewhat circumscribed in our choice; but there are many things which are both hardy and beautiful. By hardiness, we mean the ability of plants to resist freezing, thawing, drought, blight, sun-scald and fungus diseases. There is probably not a tree or shrub growing but what is susceptible to some of these weaknesses or defects; but there are many which possess only one or more of them to a limited degree, and subject to control.

DESIGNS.

Whether one wishes a lawn design, formal or natural is the first question to be considered. In the North, especially, the natural design would seem most appropriate. Nature has suggested many things and ways in which the planting may be made to appear natural, yet nature is careless, prodigal, and even wasteful in her resources, so that even she may be improved upon by judicious pruning here and there.

When you plant a tree or shrub, remember that it is planted with the expectation that it will remain for years and perhaps for generations, so the right place should be decided upon at the beginning, or transplanting will be necessary, making it expensive, perhaps even causing a loss of the plant itself. The modern spirit of landscape planting is to have it approach as nearly as possible, natural effects. Years ago, landscape designs were conducted upon a different principle. Then,

everything was formal. Even the hedge was sheared in fantastic shapes. Now, the desire is to make shrubs appear graceful, not over-crowding, nor yet too scanty in the planting. Beautiful vistas and avenues of approach should not be obscured but openings should be left here and there which will enhance the view. Even foliage and color of the bark is to be taken into consideration in producing harmonious results.

A design that is appropriate for the bungalow or the summer cottage by the lake, would scarcely be appropriate for the average city home.

TREES AND SHRUBS.

Fortunately, there are shrubs and trees equally appropriate for settings of every kind. The stately Elm will remain one of the standards for boulevards. The majestic Oak, were it not for its slow growth and difficulty in transplanting, would take a prominent place. In many parts of the Northwest the Green Ash is most desirable. It is clean, hardy and thrifty. Among the hardy ornamental trees for interior lawn planting, may be included such as the Cut Leaf Birch, one of the most beautiful of all the ornamental trees. Second, is the Mountain Ash. What a fine contrast these two trees present to each other, the latter with its red berries which are often carried into winter. Its dark, almost green bark being in direct contrast to the white of the Weeping Birch. The American and European Lindens may also be planted on boulevard or lawn. Though inclined to sun-scald, these trees when young, together with the Mountain Ash, should be wrapped with strips of burlap cut about six inches wide, tied with soft twine at the surface of the ground and wound spirally to the branches; this will remedy the difficulty.

The Golden Willow is very handsome as a young tree, but as it gets older the bark loses its handsome color and effectiveness, and becomes a dull gray. The Niobe Weeping Willow, which originally came from Siberia, introduced by Prof. Hansen of the Brookings, S. D. Experimental Station, we consider an improvement upon the Golden Willow. The beautiful, drooping habit of the long, slender branches is interesting. Best of all, the tree has proven hardy.

A northern grown variety of the Hackberry is desirable, but the southern grown or that from seed procured as far south as Kansas, will freeze back when planted as far north as central Wisconsin.

The Kentucky Coffee Tree, which is a native of some parts of Wisconsin, is a valuable addition to our northern trees. Its merits are not sufficiently known or it would be planted more generally. Its foliage resembles somewhat the Locust tree, but it is more shapely as a tree.

The Catalpas we class among the semi-hardy trees, the Speciosa being the best of the varieties. Among the semi-hardy Horse Chestnuts, the Buckeye variety is generally considered best for the Northwest.

Among the high growing shrubs and low growing trees, the Russian Olive with its light, silvery foliage presents a good effect and when it is in blossom the fragrance is delightful. The Buffalo Berry resembles somewhat the Russian Olive. It is sometimes used for a low growing hedge, but does not stand shearing well. Both of these trees are hardy and well adapted to exposed positions on the prairie.

Many of you know of the Compass cherry plum prized chiefly for its fruit for canning purposes; but it is a beautiful ornamental tree. It never grows so large that it is obtrusive, and with its umbrella-shaped top, beautiful green and closely compact form of growing, in the spring of the year when it is in bloom, is one of the handsomest of the flowering trees, and may well be substituted for Bechtel's Flowering Crab, which, in the Northwest, is semi-hardy except in protected localities.

The Caragana and Buckthorn, each of which attains a height of some 15 ft. if allowed to grow, may also be sheared making excellent low growing hedges. The shearing of hedges for formal effects may be desirable, and where high growing shrubs are used, it is necessary that they be sheared. Individual tastes are to be taken into consideration, but when sheared, the hedge losses much of its gracefulness and natural beauty.

The Ibota Privet we have found hardy; it makes a very fine hedge, also the Amoor Privet; but the California Privet is not hardy in the Northwest and should not be planted.

There is almost a limitless number of Spireas, Dogwoods, and

Lilacs, from which selections may be made to advantage. We cannot here specify regarding the different varieties. Grafted lilacs are especially desirable as they do not sucker.

EVERGREENS.

Many are partial to evergreens—others regard them as heavy and depressing, especially if planted near the house. The Colorado Blue Spruce, Pyramid Arbor Vitae and Dwarf Mountain Pine are among the most desirable of the ornamental evergreens for lawn planting. The standard varieties of evergreens are familiar to everyone.

HERBACEOUS.

The list of herbaceous plants, however, should not be overlooked, as there are many varieties which are not only beautiful but they may be so arranged that there will be continual bloom from early spring until late fall. They must be taken into consideration in connection with the grouping and massing of shrubs for flowering effects, as the plants in the herbaceous tribe may be used for borders. The Peony, of which there are some 2,000 named varieties, presents a great field for effective contrast. The Phlox, tall and low growing, pure colors and mixed colors, may be so arranged as to have bloom for at least four months in the year. The Gaillardia, with its brown and yellow coloring and long continued bloom, is very desirable. The Platycodon or Chinese Bell Flower, in colors blue and white, is also most satisfactory on account of its long blooming period. The Yucca with its stately spikes of creamy flowers deserves a place on every lawn. The Bractetum Poppy, large and deep red, is gorgeous in its effect. The Bleeding Heart is known everywhere, and the old fashioned Larkspur is again in popular favor, while the prim and stately Hollyhock has been restored to its rightful place.

VINES.

The Vine also plays an important part in lawn decoration. For the covering of rookeries, old fences, decoration of brick or stone walls, or chimneys and other odd effects, the vine is indispensable. In those localities where the Boston Ivy or Am-

pelopsis Veitchii can be grown, for climbing or clinging to stone or brick walls, there is nothing better. The next best Ivy for buildings is the Ivy Englemanni, which resembles somewhat the American Ivy; the foliage is a little finer. This also clings to brick or stone and is perfectly hardy.

The Dutchman's Pipe or Aristolochia Sipho, with its broad green leaves is massive and hardy. This vine does better when planted on the North side of buildings or even in a shady place.

A beautiful effect upon our grounds at Lake City was obtained as follows: An Oak tree some 2 ft. in diameter died, and around the base was planted a half dozen Englemanni Ivy vines. In a few years these overrun the top of the tree with a mass of vines. The effect was odd, and in the fall when the leaves had been touched with the frost, the foliage was surpassingly brilliant. The tree was situated in a place, where if cut down, it would have looked bare and empty.

SEMI HARDY.

We have experimented with 36 different varieties which were all recommended to be hardy by eastern and southern planters. In the vicinity of New York State, these things may be hardy, but in the same latitude in the West they are not. Out of these 36, we will mention only those which are perhaps most familiar, they being either semi-hardy or tender. They should, therefore, be planted with care in protected locations, if planted at all:

Calycanthus Floridus.

Clethra Alnifolia (Sw. Pepper Bush).

Cydonia Japonica (Japan Quince).

Deutzia Gracilis, Crenata, and Pride of Rochester.

Diervilla (Weigelia) are all tender except Rosea and Eva Rathke which will do well.

Forsythia Fortunia & Varidissimo.

Hibiscus Syriacus (Althea) and its varieties.

New Hydrangea (Alba Grandiflora).

Ligustrum (California Privet).

Lonicera Fragrantissimo.

Prunus Pissardi.

Ribes Sanguineum (Crimson Fl. Currant).

Spirea Prunifolia.

Spirea Reevesii.
Spirea Rotundifolia.
Tamarix Africana.
Viburnum Plicatum (Japan Snowball).
Kalmia Lalifolia (Mountain Laurel).
Wistaria (Chinese Section).
Teconea Radicum (Trumpet Flower).
Lonicera Halleana (Hall's Jap. Honeysuckle).

The Tartarian Honeysuckle, Grandiflora variety is hardy, but the Splendens, which has been recommended as being perfectly hardy, is not. It will freeze down three winters out of five. The blossom is larger and more profuse than that of the Grandiflora, but in the Northwest, it should be discarded where permanency is desired.

A few years ago the Hydrangea Sterilis Arborescens appeared and was and is recommended without stint as being hardy and desirable for all parts of the Northwest. This is really a beautiful plant. Acting upon the recommends of those regarded as authority, we began to propagate this variety and acquired a large stock. We find, however, it freezes back every winter.

UNRELIABLE.

Your attention is called to the fact that you cannot be safely guided in your Northwestern planting, by catalogs or magazines published in the South or East. You will find in this literature, various shrubs and flowers which are recommended as perfectly hardy for all points of the Northwest, but the articles are evidently written by parties who are not familiar with the conditions in the Northwest.

SUMMARY.

Plant intelligently northern grown stock that is known to be hardy and you will have no occasion to regret it.

OUR DUTY TO THE LANDSCAPE.

M. O. NELSON, Minneapolis, Minn.

Doubtless the majority of the people to whom I am talking were born and brought up chin deep in the landscape, with landscape to dig out, chop up, burn up and some to throw at the dog. Landscape stood as a bar between us and a crop of potatoes. Landscape held a first mortgage on everything in sight. The man who had spent his time mussing up the landscape sold his place as an "improved" farm and so drew dividends for his vandalism. In those days if a farmer wished to build his pigpen between his door and the public highway it was none of the public's business. If the public didn't like it the public could turn its eye and nose the other way, whip up the horse and go about its own business. If the farmer's wife chose to fling her slop water and potato parings plump into the middle of the landscape, nobody ventured to say her nay, for almost everybody was doing the same thing. But these were in the days of long distances between settlements; in the days of raw and unhampered individualism. In the days too, when we had inherited but little from our fathers in the way of respect for landscape, or in the form of landscape improved.

The times of this ignorance God winked at, I suppose, though even that did not save us from most miserable loss of God-given landscape, spoiled by the hand of dull-witted and thick-skinned men. Today if we were but awake enough to know it, landscape is property—public property—that is, your property and mine. We have rights in the landscape beyond our line fence, because, for one thing, the appearance of the landscape beyond our line fence has to do with the market value of our property. This is putting it in its crudest and most material form, because in that form the fact is most generally appreciated. To put a finer and more valuable point upon it, you have rights in the landscape because it has a hand in shaping your soul and in measuring your happiness in life.

That landscape is a tangible, taxable, marketable asset I know at first hand. I know it is taxable for when I planted a good looking shrubbery and flower garden about my home the assessor slapped an extra $750 assessment upon it for taxation purposes. That landscape is marketable I can prove because when the Park Commission of Minneapolis began dredging the Lake of the Isles, making a scenic lake out of an old marsh, the adjoining residence property values jumped skyward, in many cases three hundred per cent.

We are learning now with reasonable speed, that it is a loss to the pocketbook to mar the landscape, and a few of us know that it is a loss to the soul. This feeling is growing in village and country, though there the old fierce desire for individual liberty that drove our most valuable ancestors over seas, is yet in the blood. Co-operation and its corollary, giving up a part of our individual rights, have not yet taken hold of people who live at long arm's length from each other. Where men rub elbows, and sharp elbows dig sensitive ribs, where people are packed into brick pigeon holes and are forced to breathe each other's breath, they learn to yield personal liberty for the public good. In such congested spots the value of landscape is first appreciated. It is there that the idea grows that landscape is worth money. It was conditions like these that first brought forth Park Commissions and levied park taxes.

It is an end earnestly to be prayed for, that the rural and village population of our country will not have to pass through this stage of unwholesome congestion before they learn the value of landscape. Not all of them will, as we know by observation. Cleanliness, beauty and good morals are contagious just as are disease and vice. When as a lad I used to haul wheat to town from the backwoods, fifteen long, slow miles, I noted that I was nearing town when I began to pass painted houses and barns. Regard for the landscape will radiate from the city in the ratio that it exists there. And it will radiate from your own home wherever you live, in like ratio. Your good example may be a long time catching, and beauty in your neighborhood a long time coming. But so is the millenium. That is not to say that both are not worth working and hoping for. Because our neighbors will not co-operate, because they will neutralize much of our beauty with their ugliness is no reason why we should not beautify. It is so much the more

up to us to hold up our torch. "So shines a good deed in a naughty world." We may find much beauty in any Wisconsin landscape. I have seen this state from the beautiful oak openings of the south to the muskeg swamps of the north and I have not yet within these state lines traveled beyond the border of Wisconsin beauty. If the Almighty has done so much through the centuries to make this state pleasant to look upon, ordinary gratitude would suggest that we refrain from spoiling his bounty, and that we do a little to add to it. For in this line of endeavor we are honored in greater measure than in anything else in the material world, by being made "workers together with God." We can make or mar landscape; and in the course of a lifetime we can do large work for good or evil in God's great panorama.

I would not speak of our duty to the landscape as the greatest force that constrains us to plant and prune, water and weed according to art. I prefer to present this as a privilege. Once you have experienced years of this fascinating work you take in more pleasure through the eye from form, color, light, shadow and composition in one minute than, uneducated, you took in in a month. This is living larger, broader. Making landscape also adds to length of days while it adds to their breadth.

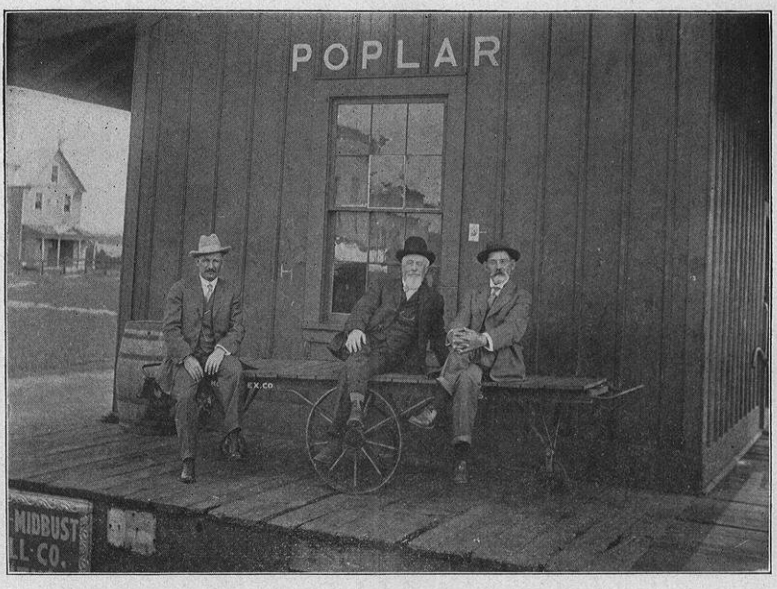
To be a fit model for others to copy, to be an inspiration to other people to improve their lives, is one of the rare joys of earthly life. I dare to believe it is one of the joys of heaven.

MORNING SESSION—WEDNESDAY, JANUARY 13.

ANNUAL BUSINESS SESSION.

TREASURER'S REPORT.

Mr. L. G. Kellogg: As many of you are aware, the fiscal year closes the 30th of June, and our appropriations are available on the 1st day of July. The Board of Managers has recommended that we make a report from the last annual meeting of 1908 until the 1st day of July, and thereafter for the full year, from July 1st to July 1st, otherwise our annual report will show what might be termed a fictitious balance.



The Trial Orchard Committee viewing the Poplar Orchard, Aug., 1908.

Cover crops, Horticultural Dept., U. W., 1902.
Dwarf Essex rape at left, oats at right.

Balance on hand February 4, 1908, $4,031.71. Paid out upon vouchers properly signed by the President and Secretary, $4,021.13; leaving a balance on the 1st day of July, 1908, of $10.58. All of which is respectfully submitted.

REPORT OF THE CHAIRMAN OF THE TRIAL ORCHARD COMMITTEE FOR THE SEASON OF 1908

WILLIAM TOOLE, Chairman.

Your committee inspected the trial orchard at Barron on Tuesday August 11, having driven from Cameron Junction with team, because better connections could be made in that way to continue our travel to the next trial orchard. The orchard is situated about three quarters of a mile from the railway depot—a little east of north. The location is on one of the leading thoroughfares and plainly to be seen by all who pass. A large sign with posts ready for placing was on the grounds, which will tell all who care to read that this is one of the trial orchards of the Wisconsin State Horticultural Society. Heavy wire netting was provided for fencing, and soon all the trial orchards of the society will be neatly fenced. It is the desire of the officers of the society and the trial orchard committee to have the trial orchards of the society a credit to the state of Wisconsin.

The situation is sufficiently elevated to give fairly good surface drainage, except that a small portion suffered from the excessive rains of last spring. The soil is clayey, and contains sufficient humus to insure good growth with a continuance of the care which it has already received.

The planting has been mostly of apple trees, and has been confined chiefly to such standard kinds as might be reasonably expected to succeed in that locality. The orchard had been recently seeded with oats for a cover crop, following the cultivation that had been done during the early part of the season by Mr. J. R. Ducklow, the owner of the property. Mr. Ducklow has shown such intelligent interest and willingness in carrying

out instructions in caring for the orchard that the society is fortunate in having the orchard under his care.

The trees of the first year's planting of one acre in 1906 have made a good growth the present season, with a few missing ones from causes which we could not ascertain, as the missing trees were of several varieties, and the trouble was not a question of hardiness. The planting of 1907, consisting of two acres, did not look as well as those of 1906 or 1908. It seemed that the difference in the quality of the nursery stock had caused the contrast. The trees planted in the spring of 1908 made a very good showing. Plum and cherry trees looked fairly well, except that there is some need for replanting.

THE POPLAR ORCHARD.

The next trial orchard visited by your committee was the one at Poplar in Douglas County. The party reached there the forenoon of Wednesday, August 12, by way of Superior.

The orchard is on the south side of the railroad with the principal wagon road between, and it is in full view of all who pass. We learned later when at Bayfield and Ashland that the trial orchard at Poplar is one of the points of interest that travelers on the railroad look for.

Your committee was most agreeably surprised at the general good appearance of the orchard. The trees which were doing well included a considerable portion of the first five acres planted. They have made a good stocky growth and look very promising. The plantings of the first five acres were done in the years 1904, 1905, and 1906. There were a number of Duchess trees bearing more than a bushel of apples each; Hibernal and Patten made an equally good showing. There were some fine Okabena apples on thrifty, healthy trees, and the Longfield trees in fruit looked very promising. A few Wealthy apple trees were fruiting and looked well, but in the average this variety made a poor showing. The North Western Greening trees have not a healthy appearance. Transcendent and Hyslop Crabs were fruiting and presenting a good appearance.

The fruit of that part of the state is decidedly later in maturing than is the case with the same varieties in the south-central

part, and could through later maturing and better keeping qualities extend the season of some varieties several weeks. A tree of Yellow Transparent in the yard of Mr. P. A. Peterson, the owner of the trial orchard grounds, held fruit which was scarcely ready for picking. The tree, which was probably eight or ten years old, showed no signs of blight and was fine in appearance. A portion of the orchard showed poorly for several reasons—the principal one being need of underdrainage in portions of it. This drainage was being done while the committee was there. The tenacious character of the red clay of this orchard has been described in previous reports. Poor stock received in different years and from different parties has caused disappointment.

The original plan of the orchard was for fifteen acres, but the committee of 1906 decided that it would be well to give up a portion of the land and establish an additional orchard at some other point. A release of three acres was secured, and a trial orchard was established at Maple, a station on the same line of railway about four miles east of Poplar. By the time this report is presented to the society an additional five acres will have been released, leaving seven acres to be continued as the trial orchard at Poplar. The schedule of trains necessitated a drive to the trial orchard at Maple.

THE MAPLE ORCHARD.

The Maple trial orchard is on land owned by E. G. Doherty, and is but a short distance from the depot northward. It is situated on the dividing ridge between the red clay basin bordering Lake Superior and the rest of the state of Wisconsin. The location is said to be one hundred seventy feet higher than the orchard at Poplar. The orchard ground slopes gently to the north. The soil is a gravelly loam, the clayey part of which is the red clay which is prevalent lower down. Two acres were planted in 1907 and one in 1908. The trees have been well cared for, and the ground had been seeded to a cover crop, shortly before the visit of the committee. Here again were noted examples of the relative values of different lots of nursery stock.

These two orchards are located on representative soils common to thousands of acres situated south of Lake Superior,

and so the lessons to be learned from them will be of great value to future settlers of this region. The present settlements are few and far apart, over a considerable stretch of country in this northern part of the state. The present outlook for fruit culture is encouraging; at Maple we found Yellow Transparent trees fruiting and doing well with no sign of blight.

BAYFIELD.

The continuance of our trip carried us to Ashland so it seemed best for your committee to visit the lands near Bayfield, because the paper by Mr. Knight has caused many people to look to our State Horticultural Society for information in regard to the fruit-growing possibilities of this part of the state. We reached Bayfield about midnight of Wednesday, and were ready to interview the place and people early next morning. A member of our party having the acquaintance of Mr. Robt. Inglis, the local express agent, our party was taken by him to see some of the fruit in the gardens of the town. The remnants of the season's picking showed that they can raise some very fine cherries in this region. Currants were very fine.

Secretary Cranefield and Mr. Inglis soon had a bunch of Horticulturists together, so our party, with Mr. Knight, Mr. Carver, and another gentleman as escorts, made a trip out into the country to see the orchards. The orchard of Mr. Turnquist has been fruiting several years, and is doing very well considering that a portion of the orchard has been in grass sod for several years. There was need of spraying here, yet there was a nice showing of fruit of several varieties. After dinner we visited one of the orchards of Mr. Knight, planted in the chopped-over lands and kept mulched with the mowings between the trees. This young orchard makes a very good showing, but in parts it was suffering from a visitation of grasshoppers. As soon as the wildness can be subdued the orchard will be thoroughly cultivated. Mr. Knight has another orchard of twenty acres on cultivated land, but the committee did not have time to visit it.

From all that we could learn it seems that the climate is modified by the lake influence to an extent favorable to the wintering of trees. The soil and altitude of this region are

variable, and so some discrimination needs be used in the selection of orchard sites. These chopped over lands need much labor to prepare them for cultivation. The conditions which we were able to examine made a showing favorable for fruit growing, but the different members of the committee know by experience that it takes time to prove all things. The abundance and luxuriant growth of wild strawberry plants over a considerable extent of this northern part of the state was very noticeable. These wild lands have been kept out of the market in the past by the lumber companies, but they are now offered for settlement.

MEDFORD.

We traveled toward Medford on Thursday night and next morning visited the fruit package factory of Edwards and Company. Here we found work going on in extent and variety much more extensive than we had expected to see.

In due time we drove out to the Medford trial orchard which is situated on the land of Mr. S. F. Harris. This orchard is on good soil with a favorable aspect, except that a portion needs some surface drainage to fit it for such seasons as the spring of 1908. The orchard consists of three acres planted in 1903, 1904, and 1905. Most of the trees are looking very well, although but few were in bearing this year. Good care is now being taken of this orchard, so that it will soon begin to prove up like the Wausau orchard is now doing. Judging from the general appearance of the country about Medford it seems as if orchards will do well in this section.

WAUSAU ORCHARD.

In the afternoon we reached Wausau and at once drove out to the trial orchard, which is on the land owned by Mr. Ed. Gensman. Our driver informed us that a great many apple trees had been planted in that section last spring, because of what has been demonstrated with the trial orchard. This orchard has been well described in previous reports. The location has been well chosen, and the site is conspicuous as well as accessible to those who wish to visit it. The orchard was seeded to clover last year, and the present season it was mowed

several times—the cutting being allowed to remain as a mulch. In an orchard of this size, so long planted, and containing so many varieties, all parts are not looking equally well, as might be expected. In some portions of the orchard North Western makes a good showing and in others not. Wealthy generally is not doing well. Thirty-eight Hibernal trees are very fine, but they are not fruiting this year. The same may be said of McMahon. Avista and Longfield, topworked on Virginia, made a good showing of trees and fruit. Newell trees are not doing very well; Repka shows up well in tree as also does Wolf River; Malinda topworked on Virginia made a good showing of fruit; Dominion Winter in fruit is doing fairly well; and Patten's Greening in fruit made a fine show. Okabena showed good trees; and Dudley, in three trees loaded with fruit, seemed to be a very desirable variety. The Lou apple and the Reitzburg, from Prof. Goff, made a fine showing in fruit. The Duchess trees had a healthy appearance and were loaded with fruit. The committee estimated that there were about two hundred bushels of this variety in sight.

If this orchard is held by our society a few years longer, and is as well cared for as now, it will be of great value as an object lesson to the people of this part of the state. Mr. G. F. Rich, who met with Secretary Cranefield and the committee to consider purchasing the fruit, said that, last spring, Mr. E. F. Wilson planted three hundred apple trees and Mr. Levenhagen one hundred fifty trees, making selection of varieties from observations of the trial orchard.

MANITOWOC ORCHARD.

A night's travel brought us, early Saturday morning, to Manitowoc where is located a trial orchard of five acres, planted in the spring of 1908 on the grounds of the county-farm. Here there was evident need of tile drainage, but Supt. Goedjen promised to have tile laid in the fall where indicated by the committee. The orchard had suffered some from extremes of wet and dry weather.

Through some misunderstanding the young trees had not received the necessary cutting back as Secretary Cranefield had directed. This lot of trees particularly needed judicious pruning, and for lack of it with unfavorable weather condi-

tions a number of trees made but a feeble attempt to leaf out.

Immediately on our return from the orchard Mr. H. F. Hubbard took the committee in hand to show them a seedling apple tree growing in a city backyard. The tree was indeed a surprise with its thrifty growth, luxuriant foliage, and fine show of fruit. The apples are of very large size and late fall in season. Mr. Hubbard says that it has many characteristics of the Duchess, but it is of much larger size and a much longer keeper.

STURGEON BAY ORCHARD.

Our next orchard inspection was at Sturgeon Bay in connection with the summer meeting of the State Horticultural Society, which was held at that place August 26th and 27th.

This was notably one of the best of the summer meetings which have been held by the society. While it is not in place here to mention in detail all about the meeting, it seems well to say that the people of Sturgeon Bay, under the direction of D. E. Bingham and A. L. Hatch, entertained their visitors in a most praiseworthy manner. The second day was devoted to sight-seeing for the visiting friends. In good time after breakfast teams were on hand to carry the party to various fruit farms in the vicinity.

Apples, plums of the Japanese and Domestic classes, and cherries all seemed to do finely here. Apple trees seem to come to bearing early. Plums were heavily laden with fruit, and cherry trees gave evidence of having borne an abundant crop. The accounts of yields of cherries were very interesting—the past season's produce of one acre of cherries planted three years ago by D. E. Bingham sold for $85.00. One hundred cherry trees planted by Mr. Templeton three years before produced sixty cases of sixteen quarts each. The cherry crop of an eight acre orchard in 1907 gave A. L. Hatch $3,600.00. Well cared for orchards showed paying results, but here as elsewhere are to be seen all grades of care and neglect in orchard practice.

The trial orchard of our State Horticultural Society was included among those visited, and was thoroughly looked over by your inspection committee. This orchard was planted twelve years ago, and it had been in grass sod eight years

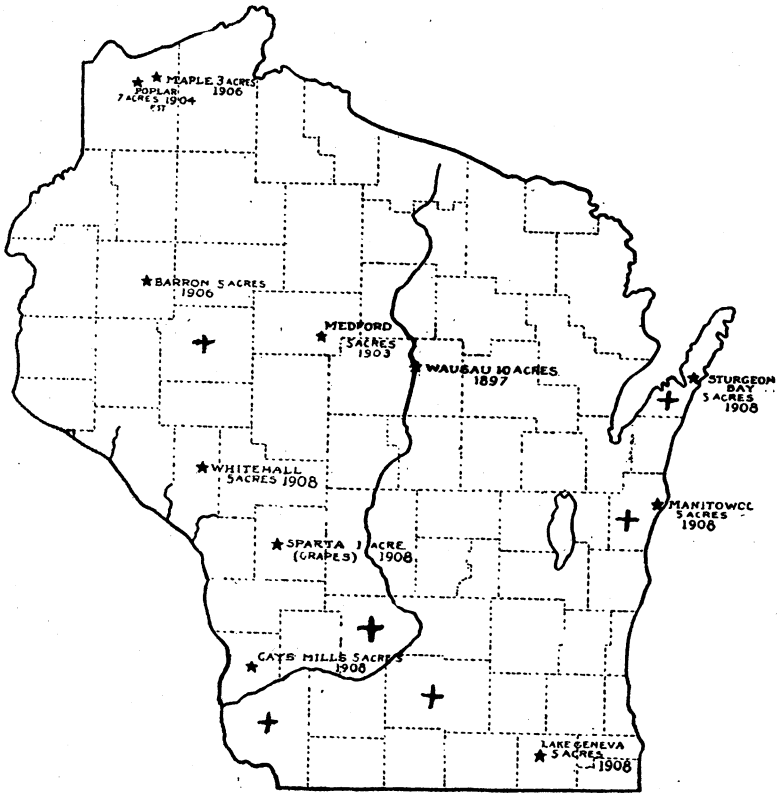
previous to the present season. The orchard consists of five acres which have been leased for five years at an annual rental of five dollars per acre.

The varieties planted are, North Western Greening and some Wealthy and Switzer. The sod was broken and subdued during the past summer. The orchard is in fairly good condition considering past treatment, but of course it will not compare with those that have been under continued good management. The output of this orchard will more than pay expenses before the term of lease has expired. It has been proved that fruit will succeed in this part of the state, but it is desirable here, as elsewhere, to show what can be done by rational orchard management. The object of taking charge of this orchard is to demonstrate that it pays to take care of orchards. The observations of your committee in different parts of the state leads to the conclusion that people as much need to know how to take care of an orchard as what to plant, and it would be well if our society could take charge of two or three other orchards in different parts of the state. The times of work in orchard management, under the direction of the secretary, may become field days when people, after published notice, can visit the orchard at the proper times to witness the best methods of pruning, spraying, cultural operations, and whatever pertains to correct orchard practice.

LAKE GENEVA ORCHARD.

The next visit of the committee was to Lake Geneva, via Zenda, on September 16th. The object of this visit was to establish an orchard in this old settled part of the state to prove that apples can be profitably raised in this section. Our party was met at Zenda by Messrs. Longland, Smith, and Dickenson, because the sites to be considered were situated between Zenda and Lake Geneva.

One site offered was fairly satisfactory, and was the only one, of those offered for our selection, which the committee thought available. As we were riding along the attention of our party was called by L. G. Kellogg to another desirable location, and all were agreed that here was an ideal place for a trial orchard. Our party returned by the way of Springfield, and in viewing a considerable stretch of excellent farming



Showing the location, acreage and date of founding of each of the trial and model orchards of the Wisconsin State Horticultural Society. Location of rural schools to be improved in 1909, indicated by +

country we noticed remnants of old orchards, which seemed to indicate that apple growing could have been successful here if efforts had been continued with the same perseverance that has been shown in other parts of the state. As plans could not be completed at that time, Secretary Cranefield was instructed to continue negotiations and report progress at the winter meeting.

The acting committee of the foregoing mentioned inspections consisted of R. J. Coe, L. G. Kellogg, William Toole, and Secretary Cranefield.

At Sparta a vineyard has been established with planting done in the spring of 1908, but it was not thought necessary for the committee to visit it this past season.

GAYS MILLS ORCHARD.

October 13th and 14th was the time chosen for inspection of the Gays Mills orchard, and the visiting party, consisting of Secretary Cranefield, D. E. Bingham, and William Toole, left Madison the forenoon of the 13th arriving at Gays Mills in the afternoon. The party was met at the station by Mr. J. A. Hays who owns the land on which the trial orchard is situated, and we proceeded at once to climb the hill on which it is located. We were informed that the orchard is about three hundred feet above the Kickapoo valley. The soil is calcareous clay loam, and the location was well chosen. The orchard consists of five acres, planted in the spring of 1908 to the following varieties: Northwestern Greening, Wealthy, Newell, McIntosh.

A part of the land was in brush and was broken for the first time in the spring of 1908. The trees make a very good showing, and there is scarcely a tree missing from the orchard. Mr. Hays is giving the orchard the best of care. He proposes, next spring, to plant a considerable orchard on his own account. This is an old settled region, and orchards here and there prove that apples can be successfully grown in this section, but there is not an orchard in this region which has been well cared for, and this trial orchard is intended to prove that apple growing in Crawford County can be made a good source of profit. Judging from the quality of the soil

and the topography of the country it seems as if commercial orcharding would pay well here. Mr. Hays said that a considerable amount of land as suitable for orcharding as that on which the trial orchard is located can be purchased in that section of the country for twenty dollars an acre. Here seems to be a good country for investment.

Those who have kept a continued interest in the trial orchards will have noticed that they may be divided into three classes: First, those which were established to make a general test of the climate in the several sections of the state, and to ascertain the relative adaptation of different varieties to those localities. Of this class are the orchards at Wauasu, Medford, Poplar, and Maple. Next are those which have been planted where apples are expected to do well, to prove that it pays to give continuous good care to orchards from the start. Of these should be mentioned the orchards at Manitowoc and Gays Mills and the one proposed for near Lake Geneva. Of still another class is the one at Sturgeon Bay which will prove that it will pay to rescue from neglect established orchards.

These orchards must be cared for, and it is the intention of the present management that nothing shall be neglected. All operations will thus become demonstrations of the best orchard practice. So much has been done in the past and is being done at present to carry to the people the gospel of good orchard management that we realize that our society has been a pioneer in conducting what in other lines of education is now called Extension Work.

The President: In Mr. Toole's report he mentioned a seedling apple, the tree of which is growing in the city of Manitowoc and Mr. Hubbard is here, and I think he has a few of those apples with him and he might like this opportunity right now to show the apples from that seedling to you.

Mr. Hubbard: Gentlemen, I would like to say a few words regarding this grand apple. I have been an apple grower since I was a child and I discovered near my home in the city of Manitowoc, I think it was 1900, I discovered a tree growing and just beginning to bear fruit. It was a remarkable tree, I had never seen anything like it; I never have seen a tree the size of that that bore so much and such large

fruit that was salable, and I am here simply because I believe that this apple is worth the attention of fruit growers in the State of Wisconsin. I am not here for any money scheme. I invited our Secretary, who happened to be there along in the early summer, to come up and look at the tree, and he said he would be very glad to do that, but he hadn't time and some other time he would go up there and see it. I listened to him, he was very courteous and very kind; he said he supposed it was just as I said, but he was not aware of the fact that I am a mind reader and I saw, looking at his face, that he thought I was one of these seedless apple men, or that I had found something that I hadn't found, and I took it a little to heart, but he was so kind about it that I could not say to him, "Now, you think I am telling you a falsehood," but I went for him some time afterward. These gentlemen who have been speaking here, Mr. Coe and Mr. Toole and Mr. Kellogg and Mr. Cranefield were in our city and I invited them to drive up, a fifteen minutes' ride, and look at the tree, and they went up there with me and looked the tree all over and they said that they had never seen anything like it before. That is saying a great deal; these men have been growing fruit all their lives, so have I, and when you find a tree that you say you have never seen anything that compares to that you must have discovered something that is pretty good. The first apple I saw from that tree was in 1900. I cut the first apple in two and laid it on a piece of paper and drew my pencil around it. There is the pencil sketch, it is four and a quarter inches in diameter and that apple weighed just a pound. That was not the only apple that was on the tree. The next year following I got some scions from on that tree and I grafted a tree out in the country a little ways that did not seem to be worth anything, a tree about ten years old, it was a healthy strong-growing tree, and I grafted a new top and there is a picture I took about four years after I grafted. This apple for the last six years I have used in my family; it will keep in an ordinary cellar until the middle of February or March. Last year, my wife told me before I left home, that she had cooked the last apple on the 16th day of March. This year, the load being so heavy on the tree and the drought being so extreme, the apples all at once all fell to the ground. Some of them broke

right open as they fell. There is one of the apples. That is the ordinary size of the apple and there is one of the marks that would indicate that it is a seedling from the Duchess. I assert that it is a seedling of the Duchess. The tree is now seventeen years old this year, approximately, it bore eighteen bushels of apples; two years ago it bore by measure sixteen bushels of apples and two years before that it bore fifteen bushels of apples, by measure, of this sort and kind. Now, this apple I am not recommending as an eating apple, but it is said by our people in the vicinity that it is one of the best kitchen apples that they have ever known. To my taste it is too tart, I would not care to say that it is a fine hand-eating apple. I am very glad to have been able to show this to these fruit men and I think they will confirm what I say and they will confirm the fact that it is a remarkable tree. The foliage is immense, the leaves are nearly twice as large as those of the Duchess, somewhat of the same appearance, same terminal limbs and all its features are similar to the Duchess, except larger, stronger. That tree seventeen years old will bear eighteen bushels of apples like that without breaking down. The one that I have photographed here is a smaller tree; one or two limbs have broken off, that is a graft from this tree that bore this fruit. I would like to ask that this Society should name this apple and put it on the list of Wisconsin fruits. That is what I am asking and I should be glad to have this done.

The Secretary: I want to emphasize all Mr. Hubbard said in regard to that seedling apple. He is indeed a mind reader. I thought he was a seedling apple crank. You know the type of man that has a seedling apple, and thinks it is the only thing on earth. I did not go up to see it, because I had things that I thought were more important. If I had known what the apple was, I should have considered that the most important thing. I believe it is one of the most remarkable seedlings, that has ever come to the attention of fruit men in Wisconsin. This really is about the size of the apples as they were on the trees last fall when we viewed it and you see it is a late keeping apple. I have no doubt these apples will keep well until February and March, and the size and the vigor of the tree and the luxuriant foliage and everything combined mark it as a very remarkable seedling. As to

whether or not we can give that a name as it is presented for the first time, I am not prepared to say, but I will say this, that I hope under no circumstances will it ever be named anything else but the Hubbard when it is named.

Mr. Hubbard: I think you had better call it the Wisconsin or the Manitowoc or something of that sort. I have quite a number of children that will bear my name down to posterity.

Mr. Kellogg: I move that this be called the Hubbard.

Motion seconded by Mr. Cranefield and carried.

ANNUAL REPORT OF SECRETARY FREDERIC CRANEFIELD.

In compliance with Art. III of the By Laws I submit herewith a report of the affairs of the Society for the past year.

The year 1908 has been beyond doubt the most profitable in the history of our Society.

Financial: Beginning with July 1st our increased appropriation became fully available giving new strength and assurance to the officers and executive committee in widening our field of operations. While the law increasing our appropriation became operative early in 1907 a debt of $1,500.00 which had accumulated during 1905–6 was paid, leaving us but little better off in 1907 than in previous years.

To know just how our funds are expended, should be, and no doubt is, a matter of interest to every member. The report of our Treasurer compiled to comply with the State law shows in detail how every dollar and every cent is expended. In addition there is submitted herewith a summary of a different kind showing by funds the ways in which the money is expended. Following our new plan of accounting this report like that of the Treasurer covers the period from July 1st, 1907 to July 1st, 1908.

During that time there was expended on account of Trial Orchards $1,630 83
Bulletins, circulars and advertising matter, printing 451 50
Postage 319 32
Summer meeting Aug. 1907 including premiums 291 73

Annual convention Feb. 1908 including premiums	933 82
Salary Secretary	1,200 00
Expenses Office Secretary	1,147 12
Office furniture	121 39
State Fair Exhibit	150 00
Farm Institutes	316 96
Premium Books (now abandoned)	43 30
Misc. inc. salary of Pres. and Treas.	239 60

It should be kept in mind that these are lump sums only and that it is often difficult to assign an expenditure to a particular fund. As before remarked the detailed list of expenditure is shown by the Treasurer's report.

Following naturally an account of the expenditure of money comes an account of the progress of work, and in this we may all find justification for pride.

Trial Orchards: The Trial Orchard work is developing rapidly, there being now eleven orchards or stations in ten different counties.

Seven of these are in truth "trial" orchards or stations designed wholly for the purpose of testing the climate of central and northern Wisconsin.

The remaining ones at Sturgeon Bay, Manitowoc, Gays Mills and Lake Geneva are located in sections where the testing of varieties for hardiness and adaptability has already been done by private planters and in sections where there are good reasons to believe that large orchards properly cared for will prove profitable.

These then should properly be called "Model" or "Demonstration" orchards. James J. Hill, railroad president, statesman and far-seeing economist in a recent address before the National Farmers Congress predicting a shortage of the food supply of the nation and advising plans to overcome it recommended the establishment of a model farm in every county of every grain-producing state. The fact that our Society has been engaged in this identical line of work in connection with the fruit industry should prove a sincere cause for gratification on the part of every member and when we consider further that the extent and value of this particular line of work exceeds that being done by any other horticultural society or experiment station in the United States we may perhaps be ex-

cused if we "point with pride" to our "trial" and "model" orchards.

Membership: While the increase in membership under the reduced fees has not been as great as might reasonably have been expected, the number of both annual and life members is greater than last year. We now have 875 (date of Jan. 5, 1909) annual members all fully paid up to date and many one and two years in advance, and 120 life members, total 995. This is an increase of 173 annual and 22 life members over last year. The loss through failure to renew has been larger the past year than in any previous year since 1903, amounting to about 50. The membership is kept on a strictly cash-in-advance basis and no favors are shown; a member of the Executive Committee or even an officer is liable to be dropped if the fees are not promptly paid. The adoption of the life membership emblem has resulted in securing several new life members. Aside from a continuous active campaign by the Secretary there are two other factors both of which might be powerful aids in increasing our membership: first and foremost an earnest effort on the part of every member to secure at least one new member annually and, second: the co-operation of all of the local societies.

Local Societies: Four of the locals viz., Lake Geneva, Madison, Manitowoc and Baraboo now enroll their entire membership, the Sparta Association furnishes a fair percentage of its members while the remaining locals, Rushford, Omro, Algoma, Waupaca, Eau Claire and Lake Mills furnish but one or two per cent of their number as members of the State Society. In no other way could these local societies be so helpful to the state Society as in enrolling their entire membership each year through action of the local society and thus relieving your secretary of the necessity of everlasting appeal for members. Since writing the above two new local societies have reported, viz: Poysippi with 30 members and the Bayfield Peninsula Society with 114 members, the latter all enrolled in the State Society.

Farmers' Institutes: In co-operation with the Farm Institute department of the University this society maintained a lecturer who devoted his entire time to horticultural work attending 36 institutes, one-half of the expense being borne by

our society. Similar arrangements have been concluded for the present season and Mr. Bingham who served as our representative last year has been re-appointed and in addition Mr. C. L. Richardson will do special work.

Publications: As the demand for our bulletins has not increased but two have been issued, No. 13, April, 1908, Spraying, 31 pages, 16 illustrations, 2,000 copies.

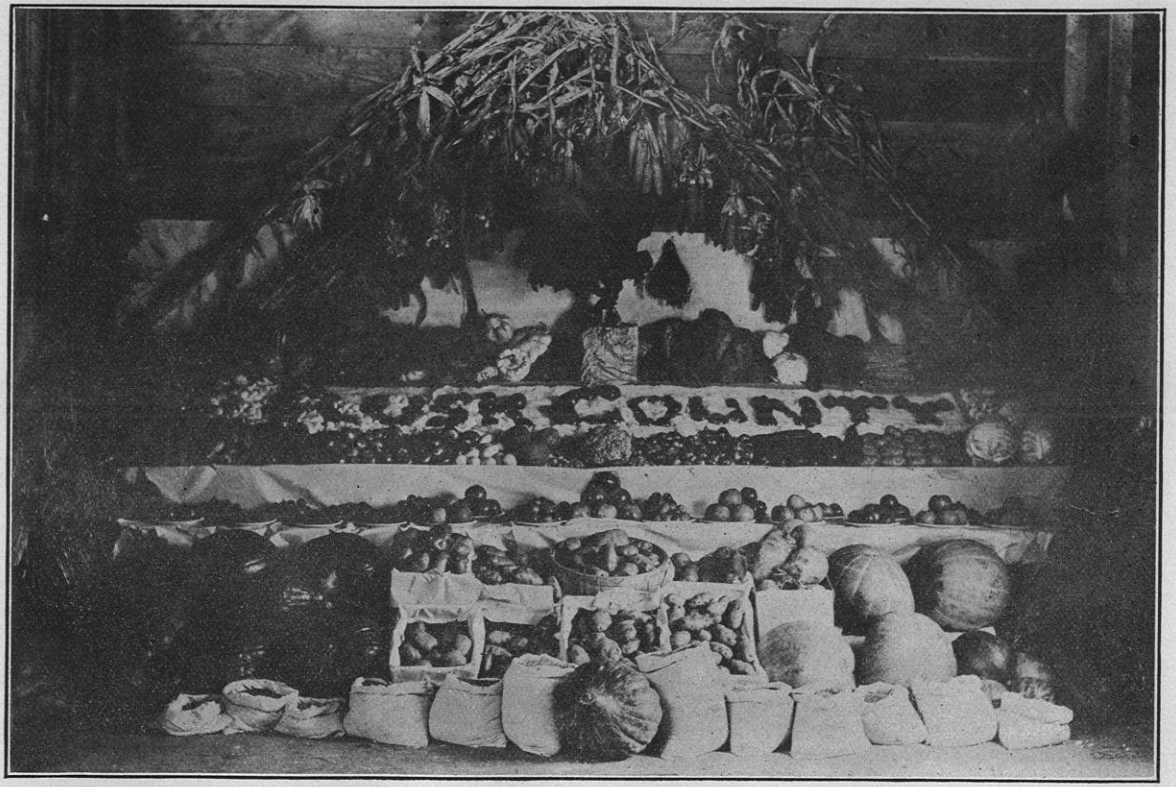
No. 14, Nov. 1908. Buying Nursery Stock, 24 pages, no illustrations, 10,000 copies.

The Summer Meeting: The meeting at Sturgeon Bay proved exceedingly valuable from several points of view. The attendance of members from different points in the state was larger than common, drawn no doubt by the fame of this region for the production of good fruit. The exhibits of both fruit and flowers greatly exceeded that of any previous summer meeting for several years.

The attendance and interest on the part of the Door County people was most excellent and in this respect the Summer Meeting of 1908 must for the present stand as the banner meeting of recent years.

Nor could the splendid welcome extended to all visitors by the Sturgeon Bay people be excelled. While the burden of details was assumed largely by Mr. Bingham and Mr. Hatch every resident of Sturgeon Bay seemed to act as a committee of one to make our stay pleasant and profitable.

On the second day the visiting members were wholly in the hands of the citizens of Sturgeon Bay. Said citizens took the delegates in hand early in the day and allowing them only a slight intermission for lunch, kept them agoing until after dark. Soon after breakfast a long string of carriages was in waiting and we were whirled over most of Door County—at least so it seemed. We were shown hundreds of acres of apple, plum and cherry trees bearing thousands of bushels of fruit. While the cherries for which Sturgeon Bay is famous were all gone, the trees were there thrifty, vigorous and glistening with Bordeaux mixture. In pruning, spraying and cultivating the growers here are right to the front. Shothole fungus, apple scab and codling moth are on hand here as elsewhere, but the growers give these pests no chance to gain a foothold. Thorough cultivation and spraying are both universally practiced with the re-



First Prize Exhibit of Fruit and Potatoes at Northern Wisconsin State Fair, Chippewa Falls, 1908.

sult that Sturgeon Bay is becoming to be known as the place where the best fruit is grown in Wisconsin.

In the afternoon a boat trip to Sawyer Harbor, the lighthouse, and ending at Idlewild, where a bountiful supper was served, ended a full and satisfying day.

State Fair Exhibit: This exhibit has now become a permanent feature and serves as an admirable means of advertising our work as well as being of considerable educational value. The two principal features of the 1908 exhibit were the exhibits in large quantities of fruits best adapted for general culture and the exhibit of fruits of Wisconsin origin, the latter attracting more attention than any other exhibit in the horticultural building.

County Fairs: Following the plan outlined in the last annual report arrangements were made with 24 county and district fairs in the state for the appointment of judges of horticultural products.

The Fair associations paid $10.00 each to apply on expenses of the judge and the Society paid a reasonable per diem to judges. Reports submitted by the judges and voluntary commendations from many fair managers show that this is a very excellent line of work for our Society. To be satisfied that there was a field for trained judges one need only listen to some of the experiences related by the judges who were employed the past year. For instance when it is learned that in one place the Yellow Transparent has been entered for years as Snow and given 1st premium, we can see the need of a little missionary work. The work has proven so satisfactory that it will no doubt include all of the County Fairs next year. Following is a list of the judges and the fairs visited by each:

Dr. T. E. Loope—Chippewa Falls, Amherst.

F. W. Harland—Plymouth, Elkhorn, Jefferson.

Albert Reis—Lancaster, Manitowoc, Marshfield, Gays Mills, Monroe.

L. G. Kellogg—Baraboo, Fond du Lac, Chilton, Beaver Dam.

D. E. Bingham—Richland Center, Wausau, Menomonie, Viroqua.

Irving Smith—Stevens Point.

W. A. Toole—Westfield.

F. Cranefield—Madison.

Fakes and Humbugs: The work outlined above covers fairly well the regular work of the Society. In addition your Secretary has spent considerable time and money in an attempt to round up and put out of business certain firms and individuals who have been engaged in humbugging the farmers of the state.

Another way of stating this would be to say that efforts have been put forth to protect people from their own cupidity and ignorance.

Contract Orchard Fakir: The first example of this kind which came to my notice was the operation in Barron County of the solicitors for a firm which succeeded in securing orders for over 30,000 fruit trees, enough to plant 400 acres (largely apple) within a radius of a few miles of Barron City. This seemed like pretty good business for one firm with less than 1,000 salable trees on hand. A little investigation showed that the sales were made on the "Contract Orchard" plan, one-half down and one-half at some future time, good bankable notes accepted for the deferred payment. As an interesting variation of the plan in this case it was found that the buyers were told, and made to believe, that apple trees should be planted 12x12 ft. apart or 302 trees to the acre! So while the sales were nominally for a given number of acres in each case the contracts said nothing about *acres* only *trees*.

While it cannot be said that there was anything of a downright fraudulent nature in this, an investigation of the agents' methods showed a deliberative attempt to deceive. When this enormous stock of trees was delivered Mr. Bingham and your secretary were called in to pass on the quality of it. Without going into detail it may be said in general that the stock was exceedingly poor in every respect and labeled without any apparent effort to "truth and veracity." It resembled on the whole nothing so much as the spring clean-up of cull stock from a big nursery.

Through negotiations instituted by the representatives of this Society a compromise was effected covering the deferred payments and revocation of many of the large orders sufficient to effect a saving of several thousands of dollars to Barron County residents.

The whole Contract Orchard scheme under whatever guise

is more or less of a swindle and the swindlers practicing the game should if possible be put out of business. Members are referred to Bulletin No. 14.

Obtaining Money (Orders for Trees) Under False Pretences: While the Contract Orchard fakir is always abroad in our land and now excites no especial interest there appeared on the scene in Walworth and Racine Counties last summer an entirely new brand of "nature fakir" namely an agent, or perhaps a nest of them, who represented to prospective buyers that he was employed by the State Horticultural Society to give people instruction in the pruning and care of orchards, etc., etc.

Incidentally at the close of his "lesson" an order was solicited "to help pay expenses" etc. In the language of the street he was certainly a "smooth proposition" and did a thriving business until arrested at the instigation of your secretary. While the offense charged against this agent was punishable by a term in Waupun the District Attorney of Walworth County on advice from this office permitted him to enter a plea of "nolo contendre" and further proceedings were suspended on payment of fine and costs amounting to about $75.00. It was reported that several other agents of the same firm were operating in the vicinity of Racine but as nothing further has since been heard from them it may be presumed that they have incidentally heard the report of the Circuit Court of Walworth County.

The agent arrested was D. W. Wood representing the Farmers' Nursery Co., of Tippecanoe City, Ohio.

In the pursuit of these and similar swindlers this Society can prove of inestimable benefit to the people of the state.

This covers in a general way the work done during the past year.

New Work: In addition to pursuing diligently the things already under way there has been outlined for the coming year at least two new tasks.

(1) Public Demonstrations of Pruning and Spraying.

(2) The Improvement of Rural School Grounds.

The first named may probably be carried on largely in connection with our Trial and Model Orchards with occasional incursions into new territory.

The embellishment of school grounds certainly offers an immense field for work and one that eventually may grow far beyond the resources of our Society.

The work has already been started but for one or two years it must be largely experimental, carefully feeling our way. When finally we have determined on some feasible plan founded on sound principles we can undertake the improvement of the 7,000 country schools of Wisconsin. Then if we find the expense too great to be borne by our society we can either ask for more funds or turn the work over to some other department.

In addition to these two new features there must be steady encouragement given to every branch of horticultural industry with special encouragement to the Co-operative marketing of fruits.

While we should not in any way abandon the idea of help to the amateur we should now devote the major part of our energies and funds to the development of commercial horticulture in this state.

We must aim to give the taxpayers of the state some return for their investment of $8,000.00 a year in our society.

The small fruit industry will continue to develop steadily in sections best adapted to it. The communities like Sparta where Co-operation in marketing is practiced will be marked as the successful ones.

It is in the planting of fall apples that the future success lies in the tree fruit business in Wisconsin. In this we have practically the entire northwest for a market and several thousands of acres of fall apples might be planted within the next ten years with no fear of overstocking the markets.

That Wisconsin is destined to rank as a fruit state there can be no doubt. If there are doubters let them look over the Sturgeon Bay district, the Richland, Sauk, Winnebago and Waupaca County and Sparta regions carefully before making positive statements. From these points there were shipped last year 104,150 bushels of apples. From these points there was shipped last year 58,000 bushels of strawberries and other small fruits.

These figures do not compare with the fruit production of Illinois, Michigan and other states but considering the steady

development of our orchard and small fruit work in recent years and our opportunities, it is significant.

There is fully as much money to be made by raising fruit in Wisconsin as in any other state in the Union. That is to say by raising the right kind of fruit and placing it on the market in the right way. There is no money for anybody in raising scabby and wormy Wealthy or Duchess apples, bringing them to glutted local markets in wagon boxes and selling for 25c a bushel but clean fall apples honestly packed in barrels will always find a ready sale at profitable prices.

Neither is there any cause to become excited nor alarmed over the wonderful stories coming to us from the far west.

Occasionally we learn the real facts about these wonderful stories. We have listened, in this Convention hall, to reports of 1,000 and 1,500 dollars being made annually from an acre of apples in Oregon and other reports nearly as large. It seems that the railroads carrying these wonderful crops heard of the fabulous profits and concluded to share in the general prosperity of the region by raising their freight rates, when Behold! we find the Secretary of the Oregon State Board of Horticulture coming out with a flat denial of the big reports! He says that exaggeration has been the rule and not the exception; that instead of 1,000 boxes of fancy fruit per acre, the average grower really can find but 300 boxes while the remainder of the crop finds an outlet only through overstocked local markets or that of the Middle West; that the final average per acre instead of 1,000 dollars is from 150 to 300 dollars per acre. Such confessions as these must of necessity be good for the souls of the Hood River people and are besides a matter of encouragement to Wisconsin fruit men.

Your Secretary can find for you at least five Wisconsin fruit growers who actually sold more than $300.00 worth of fruit from an acre last year and the field is wide open for 500 more who can do the same thing.

Believe! and you are saved. Believe in Wisconsin as a fruit state and you will win. Believe in our Society as a factor in making Wisconsin the fruit state it deserves to be and all will be well.

FRUIT PRODUCED FOR MARKET 1908.

An estimate of bushels of fruit shipped from six different points in Wisconsin in 1908. In this estimate no account is taken of the fruit sold in local markets.

	Apples. bu.	Straw-berries. bu.	Black-berries. bu.	Rasp-berries. bu.	Cherries. bu.	Plums. bu.
Baraboo	7,500	.....	.....	.....	.....	.....
Omro	2,000	1,500	.....	.....	.....	.....
Eau Claire	.....	5,000	2,500	.....	.....	.....
Waupaca	25,000	.....	.....	.....	.....	.....
Sparta	6,000	30,000	5,000	4,000	.....	.....
Door county	3,550	10,000	.....	.....	3,500	650
Richland county	10,100	.....	.....	.....	.....	.....
Winnebago county	50,000	.....	.....	.....	.....	.....
Total	104,150	46,500	7,500	4,000	3,500	650

LOCAL SOCIETIES.

The following Local Societies have forwarded reports from which the following data has been compiled.

Name of Society.	No. of members.	No. members enrolled in state society.	Fee for members.	No. of meetings, 1908.	Average attendance.	No. of exhibitions, 1908.	Average attendance exhibitions.	Amount paid in premiums.
Baraboo Society	23	14	50c	3	20	.....	.....	.....
Manitowoc County Society	54	12	50c	5	20	2	40	.....
Oshkosh Society	41	6	$1.00	10	20	1	.....	$400
Algoma Society	32	8	25c	12	40	.....	.....	.....
Omro Society	33	5	50c	9	50	.....	.....	.....
Eau Claire Fruit Growers Association	75	4	2.00	12	40	.....	.....	.....
Rushford Society	27	5	25c	5	10	.....	.....	.....
Madison Society	34	34	1.00	4	10	.....	.....	.....
Lake Mills Society	20	4	25c	4	30	1	.....	.....
Lake Geneva Society	43	43	5.00	26	25	2	700	300
Waupaca Society	25	2	25c	4	25	.....	.....	.....
Sparta Fruit Growers Association	259	30	Stock Co.	13	150	.....	.....	.....
Bayfield Peninsula Society*	114	114	50c	.....	.....	.....	.....	.....
Poysippi Society*	30	.....	.....	.....	.....	.....	.....	.....
Total	810	281						

*Organized December, 1908.

REPORT OF SECRETARY AS SUPERINTENDENT OF FIELD WORK.

This report will be confined to the briefest possible statements of facts and policies as the report of the chairman of the visiting committee covers in detail the general conditions of the orchards.

WAUSAU.

Orchard now in sod; grass cut three times during season and left on ground; crop fair for "off year;" varieties fruiting—Duchess, N. W. Greening, Longfield, McMahan, Patten, Wealthy, Dudley, Okabena, Hoadley, Dominion—in addition to many in the experimental plot.

Yield of apples estimated at 350 bushels. Cherries 406 qts. Plums fair crop.

Canker almost entirely subdued although an occasional case is discovered. 12 Duchess planted to fill vacancies next to highway.

MEDFORD.

Orchard in good condition, losses of trees very slight; a few trees bore for first time; orchard enclosed with woven wire fence and turned posts.

BARRON.

In the three acres set, (one acre 1906, two acres 1907,) 95 trees died during 1907 as follows:

One McMahan, 1 Wolf River, 7 N. W. Greening, 5 Longfield, 2 Tolman Sweet, 5 Fameuse, 3 Wealthy, 3 Gem City, 7 Early Richmond, 1 Iowa Beauty, 10 Utter, 10 McIntosh, 4 Scott Winter, 10 Patten Greening, 4 Rockford, 4 Hawkeye, 14 Montmorency.

The high percentage of loss of native plum, Patten Greening, McIntosh and Utter may be attributed to poor stock set 1907.

Two acres were set May 16th to 20th, 1908 as follows: 50 Duchess, 50 Hibernal, 60 Patten, 60 Wealthy, all from C. G. Patten & Son.

Stock excellent, ground rather dry but followed by good rains.

In addition several trees of South Dakota Hybrid plums were planted. These were sent by Prof. N. E. Hansen, Brookings, S. D.

MAPLE.

In the 2 acres set spring of 1907, 30 trees were found to be dead and were reset.

Three Wealthy, 1 Fameuse, 1 Iowa Beauty, 1 Dudley, 3 Utter, 9 Hammer, 5 Surprise, 5 DeSoto, 2 Ey. Richmond.

One acre was planted as follows: 25 Patten Greening, 15 Hibernal, 20 Wealthy, 18 Duchess, all from Geo. J. Kellogg & Sons.

Trees set 20 by 22 ft.

Weather good, soil in excellent condition.

Date of planting May 21-22.

POPLAR.

Planted 300 trees as follows:

One hundred Hibernal, 100 Duchess, 50 Patten, 50 Longfield, all from C. G. Patten & Son.

The total number of trees which died during 1907—426.

Of the following varieties all or nearly all of the trees have died.

Gem City, McMahan, Golden Russett, Tolman, Plumb Cider, Red Astrachan, Ben Davis, Pewaukee, Fall Orange, Seek-No-Further, Utter, Scott, McIntosh, Willow Twig, Lily, Ray Seedling, N. W. Greening, Wolf River, Pound Sweet, Windsor. All Cherries.

Of the above nearly all were 3 or 4 years planted. The heaviest and most surprising loss was in the case of the N. W. Greening and McMahan. These were extra large trees when planted and grew fairly well for a year or two but all died outright last year. This taken with the loss of the N. W. Green-

CHART

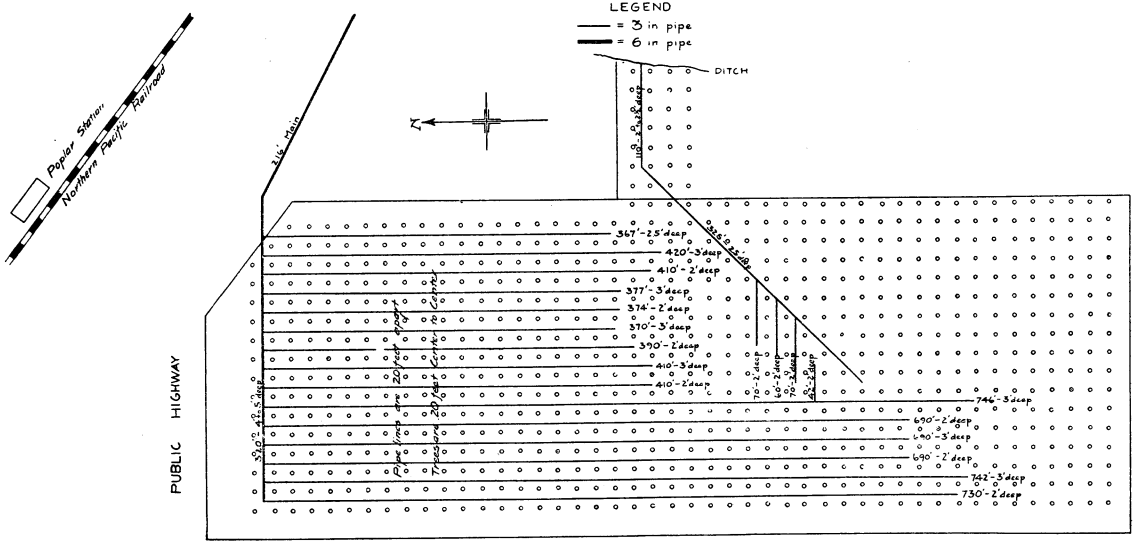
OF

DRAIN TILE

LAID IN

POPLAR ORCHARD Nº 4

SCALE : 1 in = 50 ft SEPT. 12, 1908



ing at Maple and Barron would seem to place it in the undesirable list for northern latitudes.

Of the following 40 to 50 per cent have died each year: Fameuse, Haas, Malinda, Newell, Yellow Transparent and Martha Crab.

The following may be placed in the first order of hardiness: Duchess, Hibernal, Longfield, Okabena, Patten, Wealthy, with these crabs, Hyslop, Brier Sweet, Sweet Russett, Transcendent.

During the past year five additional acres have been released, leaving but seven acres in the Poplar Orchard.

Following instructions of the Trial Orchard Committee all but the upper part of this seven acres was tile drained. In all *8,807* ft. or *534* rods or 1 2-3 miles of tile were laid consisting of one 6 inch main *536* ft. in length laid at a depth of 5 ft. and 16 laterals, averaging *517* ft. in length of 3 inch tile. Of these one-half, alternate rows, are 2 ft. deep and the others 3 ft. The cost of tile and freight was $175.00; cost of labor and superintendence $387.19. The cost per rod including unloading and distributing, tiling and covering was a trifle over 73c. In this work we were aided very materially by the department of soil physics of the Agricultural College. The thanks of the Society is due to Prof. A. R. Whitson and his assistant Mr. Delwiche for assistance which was freely given at all times. It is to be noted that no charge was made by them even for expenses incurred.

The general condition of the Poplar orchard is now most excellent and the outlook is decidedly encouraging. Many of the Duchess, Wealthy and Hibernal trees bore for the first time this year, some of them carrying fully a bushel of fruit. For trees planted but four years and within the sight of the North Pole this in the language of the day is "going some."

STURGEON BAY.

The work of renovation was pursued diligently this season under the direction of Mr. Bingham. The trees were carefully pruned, sprayed as needed and the orchard thoroughly tilled. All this should serve to insure a profitable crop next year.

New Work: Two new orchards and one grape station were

planted in the spring of 1908, viz., at Gays Mills, Manitowoc and Sparta. In addition two other orchard sites have been selected by the Trial Orchard Committee to be planted in the spring of 1909. One of these is on the County Farm of Trempealeau Co. at Whitehall and the other 1½ miles from Lake Geneva.

GAYS MILLS.

This orchard is located on the farm of J. A. Hays about 300 ft. above the Kickapoo river.

Three hundred seventy-five trees, 24 by 24 ft. Seventy-five each of Wealthy, N. W. Greening, McMahan, Newell and McIntosh.

Wealthy, N. W. G. & McMahan from C. G. Patten & Son, Charles City, Ia. Newell from Geo. J. Kellogg & Sons, Janesville. McIntosh from E. S. Welch, Shenandoah, Iowa.

Stock all first class except McIntosh which was very light and poorly rooted.

Soil clay loam with little gravel, part entirely new land just cleared, remainder in good condition following corn.

Trees planed May 5, 6, 7, 1908. Weather cool. Ground moist. Good rains followed.

This the first year of the Gays Mills orchard was marked by success in every particular. But two trees were lost and one of these made a good start being killed late in the season by fire blight.

MANITOWOC.

Five acres. Three hundred seventy-five trees. One hundred fifty Wealthy, and 75 each of N. W. G., McMahan, and Fameuse.

Wealthy, N. W. G. and McMahan from Patten. Fameuse from Stark Bros.

Trees 24 by 24 ft.

Weather very wet, trees planted in mud.

Planting done by G. W. Riegle.

Stock all reported good, especially Fameuse.

Owing to bad weather and very wet soil at planting time the

further fact that the tops were not sufficiently pruned about 50 trees failed to start. The extremely wet spring followed by an unusual draught was especially hard on this orchard. Owing probably to the unpruned tops a large part of the trees started but feebly until late in the fall. The outcome is problematical but with a favorable season next year the orchard may recover.

SPARTA.

One acre of grapes planted as follows: Four hundred Moore's Early, 200 Worden, 20 Moore's Diamond, 20 Delaware, 20 Campbell's Early, 20 Agawam.

All but 200 Moore's Early from E. S. Welch, Shenandoah, Iowa, these from T. S. Hubbard Co., Fredonia, N. Y.

Planting done by G. W. Reigle.

Welch stock reported very poor. Hubbard stock reported very good.

For some reason the growth of the vines was less than it should have been and the losses greater. The vineyard was well cultivated and next year should be well on the way to success.

QUESTIONS AND ANSWERS.

Ques.: (1) Will a heavy mulch of stable manure put over the roots of apple trees before the frost goes out have a tendency to hold the bloom back?

A Member: It will not.

Mr. Muhlenkamp: I think it will not. I have tried it four or five times and find it does not amount to anything.

Mr. Melcher: If it is put on the ground after it is frozen hard, I think it will.

Mr. Geo. J. Kellogg: I do not think it will. If you put it on where the influence of the sun comes up, the sun will bring the tree to blossom while the frost is on the ground.

Prof. Sandsten: I think Mr. Kellogg is entirely right. A number of experiments have been performed to test this question. It has been found uniformly that mulching will not retard blossoming in the spring, and if all food material for the leaves is already in the tree above ground, it is simply a question of sunshine and warmth to start the tree growing.

Mr. Geo. J. Kellogg: The pruning in June should be done after the sap thickens, just about the 15th or 20th of June; a better time to prune for the producing of extra fruit buds is in March. That covers the ground, I guess.

Question (3): Is an old orchard just as well in grass as in cultivation?

Mr. Muhlenkamp: I do not think it is. I think an old orchard ought to be plowed anyway every three years. I have plowed my orchard now for the last twenty years regularly about every three years, seeded it in clover and it will naturally run into June grass in two years again and I always plow in the fall; generally do a great deal of pruning in November just before I plow. I like to plow in the fall, because the bark is tight to the tree, you can hardly rub it off with a whiffletree and I find the wounds will heal quicker if pruned in the fall than in the spring. I have pruned in June and after that I have done all my pruning in the fall.

Mr. Spurbeck: What depth do you plow?

Mr. Muhlenkamp: Well, I plow about four to five inches, have to plow deep enough so as to hold the plow solid to the ground. Years ago I planted my orchard too close, I have to cut out a good many trees now on account of that, and I plowed again last November and the ground was perfectly gray, you might say with roots that keep growing all the time and I kept cutting the roots, but I had plowed that way before and it did not seem to injure the trees at all.

The President: Would you prefer late fall pruning or late winter pruning?

Mr. Muhlenkamp: I think I prefer fall pruning, I prune in November, paint them over pretty heavy and the limbs made a bigger growth, covered the wound more than any other time of the year. If you have to prune in the summer, if a limb breaks off, you have got to cut that smooth with a saw, but I find they make the biggest growth by pruning in November.

Mr. Bingham: I think all who have had any kind of experience in pruning orchards realize that fall pruning, if done late, is considerably injurious to the tree, causing them to winter-kill where we have severe winters, where, if pruned in late winter we avoid all that trouble. You will find any nursery-

man that prunes late in the fall and does not leave a stub on that limb to protect from the body of the tree, that the tree will be injured in the body, causing considerable injury to the tree, and I think it would not be safe for us in Wisconsin to advocate late fall pruning, or summer pruning. Summer pruning has the disadvantage of taking considerable foliage off the tree and we know that is injurious. I think that there is only one proper time to prune for our commercial orchards and that is in the late winter, say March or April, before the sap begins to flow.

Mr. Hey: I am new in the business as an orchardist. I have a young orchard which I cultivate constantly with the disk harrow and other tools in the fore part of the season. They talk about running an orchard to grass or clover, how long ought I to continue to cultivate that orchard before putting it into grass or clover?

Mr. E. A. Smith: We have several thousand trees, and our experience may be of some worth to you. We plow very early in the spring, then we use a disk harrow and it is the very best means of cultivation; you can set it one side or the other if the trees are headed low, you can get under the trees all that is necessary and growing apples in a young orchard or an old orchard without cultivation is folly. One object of cultivation is to conserve the moisture, shallow cultivation will not do this, and a large tree needs all the moisture it can possibly get in this climate, and unless it is cultivated it will dry out quicker. We have one large orchard on a side hill so steep that we cannot cultivate; we dig around it some six feet in diameter, that is forked after every shower so that we save all the rain and the trees did fine and the fruits makes well, but in orchards that we did not cultivate, we have experimented extensively, they are comparatively a failure, because the fruit is very small and sour.

Prof. Sandsten: The question of cultivation is an individual question after all; it is a question of location of your orchard, a question of your soil. Young trees should be cultivated, but there are times when you cannot cultivate older orchards, especially if they are located on a hillside. The question of cultivation or no cultivation is certainly a question of individual orchards, yet as a practice on good, level land, cultivation of course is the ideal method of growing.

HOW I CAN MY GARDEN PRODUCE FOR WINTER USE.

MISS BLANCHARD HARPER Madison, Wis.

Mr. Cranefield has asked me to tell you how I can my garden produce for winter use, and I am willing to do so in order that the pleasure the results of my efforts have given to me and my friends may also be yours. I need not say pleasure only but should lay some stress on the profit also as may be shown in the one fact that Mrs. Geo. N. Knapp whose husband was formerly a professor in the College of Agriculture, made eighty dollars the first year she accepted any orders and the second year refused further orders when those received amounted to three hundred dollars. I have more than once been offered four dollars per dozen pints of canned peas, and cost of cans extra.

Any one who has had peas, corn, string beans, etc., canned at home will not willingly go back to factory goods. The flavor is exactly that of the fresh vegetable, and there is absolute certainty of purity.

Please bear in mind that I in no way claim to be the originator of the following recipes. Some of them are taken directly from Mrs. Rorer's *New* Cook Book and the ones for the corn were worked out by my friend, Mrs. G. N. Knapp, now of Stanton, Minn. In some cases I have changed or adapted a recipe, but in all cases, I shall as far as possible credit the originator.

Before giving the recipes, it will be necessary to consider a few preliminary preparations and to mention several cautionary *"don'ts"* to the unwary housekeeper. The preliminary care for canning vegetables must begin in the picking and handling in the garden, and the necessary directions will be given with the recipes—but the preparations in the kitchen are the same for all and can be given here.

This kind of canning is merely sterilizing food stored in sealed jars, and once the contents has been thoroughly sterilized there is no likelihood of spoiling for several years if the sealing is intact, except under one condition and that condition is

so important, so underrated, so generally ignored that I can hardly place too great a stress upon it—and that is *clean jars,* chemically clean jars. How many times do women canning use a jar stained by previous contents, or a mason jar cover roughened and whitened and corroded inside, by the fruit acids of last year's canning, how many stop to consider the possible chemical combinations and deposits made by the action of fruit juices on the metal under that innocent looking opal disc in the cover of the Mason jars. A woman will do every stage of the process carefully and well, then after all her efforts put on a contaminated and corroded cover, ignoring the fact that in so doing she is merely adding unknown lead and zinc salts to her fruits, then wonders why they taste queer. On that account I prefer to use glass topped jars. There are a number of different makes on the market, as nearly every manufacturer of mason jars also makes the glass topped. The first cost of the latter is more than Masons but when balanced by corroded covers which must be renewed and spoiled cans, it comes out even about the second year. Never use a jar or cover that is stained. If hot soap suds does not remove the stain, soak the jar for 24 hours in strong solution of washing soda, if that fails use commercial hydrochloric acid one part water, two parts (can be used over and over again) or try sapolio, bon ami or dutch cleanser—and if all these fail use the jar for pickles or throw it away.

Never use a rubber ring a second time. Buy the best you can get. They should be soft, flexible, not too thick, and should not stretch in the boiling.

Never touch or handle the cover or rubber on a *sealed* jar. The steamed juices in cooling form a delicate cement between the cover and rubber, and this, if broken by turning or handling is liable to start a leak and admit air. Always lift a jar by the jar itself, never by the cover. Keep your jars in a cool, dry, dark place after canning.

Provide the following utensils: (1) A boiler or kettle with flat bottom and with a close cover. The kettle should be deep enough to take pint or quart jars and yet leave an inch of space above them. An ordinary tin wash boiler such as is used for clothes is the best when a number of jars are to be done—but when I have only one or two I use a soup kettle.

(2) Provide a piece of expanded metal lath, or galvanized wire netting having ½ or 1 inch mesh cut to fit the bottom of the boiler. Or have a wooden rack made to fit the boiler. Either should lie flat. The object is to lift the jars from the bottom of the boiler to prevent them from bumping when the water boils hard.

(3) Plenty of new good rubbers.

(4) One or two extra jars for emergencies.

(5) Boil one or two gallons of water for ten or fifteen minutes after it comes to a boil. Cover it while cooling and keep it covered until used as shown later. The objects in boiling the water are threefold: (1) To sterilize; (2) To expel the air absorbed in it; (3) To throw down the lime if the water is hard.

With clean jars, rubbers, covers, and the above utensils one is ready to try the first vegetable.

PEAS.

As the variety of peas grown makes a great difference in the result, I will state that my friend Mrs. Knapp tried canning "Telephone" peas and found them so unsatisfactory that she said "One would not know them for the same vegetable as yours." I always use the following varieties: Little Gem, Premium Gem and Advancer. Nott's Excelsior were not bad. Gradus I did not care for.

It is labor lost to can old peas. Peas for canning are better picked when *best* for the table but betteer too small than too large.

As peas ripen the development of starch makes them difficult to keep when canned. Canning also emphasizes any tendency they may have to a mealy flavor. Peas should be picked in the early morning, when they are cool. If the pods are dirty or the pickers of questionable cleanliness, *wash the pods before shelling.*

Fill a pint jar half full of the sterilized water, (if the water is put in first air is not imprisoned in the space between the peas, to cause trouble in boiling). With clean hands shell the peas directly into the jar until it is full. Add ½ teaspoon of salt. Lay on carefully washed rubber ring, then the cover

First Prize McMahan Apples at Wisconsin State Fair, 1908.

loosely fastened. When all jars are ready place them in the boiler on the wire or wooden rack. Now pour in cold water until it comes to two-thirds the height of the jars, cover and put the boiler on the stove and boil two and a half hours from the time the water boils. Quarts should boil three hours. As soon as the period is up turn the fire out and *without delay* as quickly as possible lift the jars out one at a time and tighten the cover before lifting another to tighten. One bushel of peas makes 10–12 pint jars.

Never, never, never, lift a cover off the jar, as that would admit infection of moulds and ferments. Let me repeat again *do not delay* in tightening or sealing covers as soon as the water ceases to boil; if you do you can in a few minutes hear fresh unsterilized air carrying all sorts of germs of moulds and ferments sucking into your jar to ruin your work. I consider this and the question of clean jars and covers and good rings the crucial points of the whole process. Everything depends on them. Adapted from Mrs. Rorer.

ASPARAGUS.

I have never myself canned asparagus, but give herewith Mrs. Rorer's recipe for those who care to try.

Wash and trim the asparagus. Cover it with boiling water, boil fifteen minutes, drain, cool, and arrange it neatly, heads up, in wide mouthed jars; adjust the rubbers, fill the jars to overflowing with water that has been boiled and cooled; add a half teaspoonful of salt and lay on the tops loosely. Cook the jars in the boiler one and one-half hours as directed for peas and finish in the same way.

BEANS.

String beans should be picked before the dew falls in the evening or after it is dry in the morning, and kept in a cool place covered with a cloth or wet paper to keep them crisp. Mrs. Knapp and I have used the Stringless Green Pod, and the 1000—1 Refugee with the best satisfaction. I tried some wax beans one year but found them flavorless and unsatisfactory. String and cut the beans as for the table, throwing them into

cold water as they are cut, drain them and throw them into boiling water to cook until they can be pierced by a silver fork without breaking and they must cook no longer. If they are cooked too long at this stage they become soft and mushy in the cans. Remove from fire, drain immediately and pour cold water through them in a colander until they are *cool and firm.* If one has not a faucet or pump, three or four changes of water will be sufficient. Use plenty of water. This cooling is called blanching by some writers.

Half fill the jars with the sterilized water, then put in the beans which have been thoroughly drained and pack them in as firmly as one can without crushing, add one-half teaspoon of salt. Finish as directed for peas cooking one and a half hours

Young and tender beans require little more than scalding in the preliminary or first cooking, but old beans require sometimes fifteen or twenty minutes according to toughness and quantity. It is advisable on this account not to cook more than four or six quarts at a time for the preliminary cooking. Shelled Lima beans are done in the same way. Adapted from various sources.

BEETS.

Young beets may be canned either whole or sliced, and with or without vinegar.

MRS. RORER'S RECIPE.

"Select young fresh beets; wash, put them into boiling water and boil carefully for thirty minutes; then remove the skins, and pack the beets into quart jars. Add a half pint of vinegar to a quart of water that has been boiled and cooled; fill the jars with this mixture. Finish as directed for peas, cooking forty-five minutes."

After cooking the beets thirty or more minutes, I rub off the skins, slice the beets, run cold water through them, then half fill the jars with sterilized water, then put in the chilled beets and finish as directed after adding half a teaspoon of salt. They should boil an hour in the boiler. I have also canned young carrots and spinach in this way. The carrots were successful but as carrots can be so easily stored in the cellar in

sand, it is not necessary to can them. One can out of several that I did of spinach was successful. I am inclined to think that the others would also have been had I canned them in the orthodox way, but I tried cooking them in the hay box instead of the boiler and so failed.

CORN.

Many years ago Mrs. Knapp saw a paragraph in the Breeders' Gazette telling some woman's experience in canning corn. On that foundation she has since worked up the process hereafter given.

The paragraph mentioned particularly the fact that the corn must be gathered at such an hour of the day that there should be no moisture upon the husks from rain or dew, that after gathering the corn must be spread out separately to avoid all danger of heating or sweating by piling in heaps.

The other details of manipulation are Mrs. Knapp's.

As said before the corn must be dry when gathered, the weather must not be damp, rainy or cloudy. Mrs. Knapp would sometimes gather her corn when a thunder show threatened, but never after. The canning must be done only on clear pleasant days—never on a rainy day—why we do not know, but corn canned on a rainy day is more liable to spoil.

After gathering the corn should either be used immediately or spread out on the floor of porch, shed, or cellar. It should be husked and the silk brushed off with such a brush as is usually used to wash vegetables. After brushing the corn is cut from the cob with a sharp knife, not too close, and then the cob scraped down to get out the milk and pulp still adhering. As soon as enough corn is cut to fill a pint jar it should be immediately put in the jar and packed down firmly with a spoon or better still a stick just wide enough to go through the mouth of the jar easily and shaped something like a potato masher.

The jar should not be filled above the shoulder to allow for expansion by heat of cooking. Mrs. Knapp adds no salt. I use ½ teaspoonful to each pint. As fast as filled each jar should be loosely covered and set in cold water to keep cool until all are ready for the boiler.

Do not put on any rubbers at this stage.

When all the jars are ready put the grating or rack in the boiler, fill with cold water to two-thirds the height of the jar and boil for two hours after it begins to boil. If during the boiling any of the jars boil over they must now be wiped clean. The rubbers are now adjusted making sure that no particle of corn be between them and the glass or the cover, and the cover must be fastened tight. The jars are then replaced in the boiler and enough hot water added to completely cover them. They must boil for one and a half hours longer after coming to a boil. The jars must not be taken out until thoroughly cool. Wipe jars clean immediately as the scum is difficult to remove when once dried. The expansion of the corn in cooking varies greatly in the different varieties of corn and also the age. And this expansion is to be guarded against because it sometimes blows the covers off. No water must be allowed to enter the jars. By tight or firm packing and so excluding the air from between the kernels, the expansion seems to be lessened; but an even more important factor seems to be the prevention of fermentation previous to cooking by working quickly and without interruption from the husking until the corn is in the jars and then keeping the jars standing in cold water.

There is another way of doing corn when it is to be used for cream soup, fritters and pudding, to score each row of kernels and then scrape out the pulp with a knife leaving the hulls on the cob; or this may be done more rapidly by a corn-scorer, which can be purchased for fifteen cents.

This pulp should be handled even more rapidly than the cut corn. The jars, owing to the great expansion which takes place in cooking, should be *only half filled.* It is impossible to cook it and have a jar more than half full when finished; hence it is more economical, cleaner and less aggravating to start with a jar half filled and get it all. It is cooked exactly as in the first recipe. Corn put up according to these recipes is delicious and well worth the effort.

Frequently in cooking the jars I myself do not follow Mrs. Knapp's method of tightening the covers and adding hot water to cover at the end of two hours; I cook the jars two hours, wipe them clean, adjust the rubbers, lay on the covers loosely, and cook for the additional hour and a half, then close at the end of the time. But I must admit that my way is not as

safe and sure as Mrs. Knapp's although I have never failed in it.

Mrs. Knapp and I have tried the following varieties: Early Crosby, Melrose, Portland, Stowell's Evergreen, Ziz Zag Evergreen and Country Gentleman. They are all delicious—but the Early Crosby and the Zig Zag Evergreen seem to stand the canning better. Corn for canning should be picked when best for the table. Old corn like old peas is difficult to keep.

As a rule from 5 to 7 ears are required for a pint of cut corn, although we have used sometimes as many as ten and as few as four. It all depends on the corn.

There is another method of canning corn, which my friends have tried, and which is much more expeditious—keeps perfectly but the corn lacks the delicacy and flavor of Mrs. Knapp's recipe.

TOMATOES.

Tomatoes form an important element of modern cookery, taking their place as vegetable, salad, soups, purées and sauces for meats, macaroni, etc.

The method of cooking I use in putting them up belongs to Mrs. Rorer's recipes, but the flavoring and many other details is my own. "Adapted partly from Mrs. Rorer" I think should be the label on the following recipes. Use only good, solid, fleshy tomatoes.

STEWED TOMATOES.

Select tomatoes carefully, scald by dipping for a minute or two in boiling water to loosen skin, skin, and divide the tomatoes if very large. Put them in a porcelain lined kettle, and add enough onion juice or chopped onion to taste. I use one small onion to two gallons of tomates, and a half teaspoon of celery seed, eight or ten peppercorns and a tablespoon of salt. Boil until the tomatoes are as thick as are usually served on the table, then pour them into clean jars, put on the rings and cover loosely. Set the jars in the boiler, and fill to two thirds height of jars with water about the temperature of the jars of tomatoes, warm if they are warm, cold if they are not. Bring to a boil and boil ten minutes. Remove at once from boiler and tighten covers.

TOMATO PUREE FOR SOUPS AND SAUCES.

Cut up sound tomatoes and boil in an enamel or porcelain kettle until thoroughly soft. Strain and wash through a colander, then through a fine sieve. Return to the kettle and add for two gallons of tomatoes the following: 1 tablespoon salt, 12 peppercorns, ½ teaspoon celery seed, 1 small onion chopped, 2 bay leaves, 6 cloves, 6 allspice, 1 bunch parsley. Cook slowly until tomatoes are thick, then turn into jars and finish as in preceding recipe.

To use these tomatoes:

For soup: Add an equal quantity of soup stock, butter and flour to thicken and a few drops, if one likes it, of kitchen bouquet.

For tomato bisque: Add a salt soup of soda to the tomato heated, then an equal quantity of hot milk, thickened with butter and flour and serve immediately.

For a sauce for chops, cutlets, fish, etc.: Merely heat tomatoes and thicken with browned flour and butter. A little left over gravy or soup stock may also be added with advantage.

TOMATOES WHOLE FOR SALAD.

Carefully select tomatoes of globular shape which will just slip through the mouth of the jar. Scald and skin them as directed for stewed tomatoes, take out the stem and core and slip the tomatoes gently into jar. Mrs. Rorer adds merely the sterilized water and a little salt but I add the following liquid.

The day before I stew a small quantity of tomatoes until soft and then set the kettle aside to cool and settle. The following morning I carefully pour off all the clear liquid floating on the top, strain it through a jelly bag, and boil it for a few minutes with onion, bay leaves, celery seed, peppercorns and parsley, then cool it and use it to fill the jars of whole tomatoes.

The jars are covered with rubbers adjusted and placed in the boiler with cold water. Bring to a boil and boil ten to twelve minutes only. Remove immediately from the boiler. When wanted to serve, drain off the juice, thicken with gelatine and use it to imbed the tomatoes either single or together.

NOTES.

A pint can packed as directed furnishes enough for six persons for one meal.

All my canning is done on a kerosene stove at a very slight cost for fuel.

The boiling of the jars must not be checked or interrupted. If the water around the jars boils away it must be replaced by boiling, not cold water. The water around the jars should be replenished if much boils away. Cold water if added cracks the jars.

My experience leads me to think that after one year canned vegetables commence to loose flavor decidedly. I have cans which after three years show no sign of spoiling, but never the less while perfectly sound would be found flat and flavorless. Every jar in which sterilized water is used should be filled to overflowing with the water before closing. Gummed labels will adhere more securely if applied before jars cool.

QUESTIONS AND ANSWERS.

Preceding the Convention forty-five questions were received by the Secretary and printed in the program, but owing to the limited time remaining after the completion of the regular program but few of these questions were discussed at the Convention.

These discussions are given below and also answers solicited by the Secretary from different members, following the Convention.

Question (2): Is it best to prune in last of May or first of June when in bloom and full flow of sap? Will wounds heal better?

Ans. No. ,Prune apple trees last part of March on a dry sunny day.—A. D. Barnes.

Ans. Wounds heal better with me in April than any other month.—A. J. Phillips.

Q. (3) Is an old orchard just as well in grass as in cultivation?

Ans. As a rule all orchards whether old or young should be

cultivated. Grass orchards will not prove profitable. There are conditions where it is necessary to keep the orchard in sod especially when the land is too steep for cultivation or where there is danger of washing away of land, but only under these conditions should the orchard be left in sod.—Prof. E. P. Sandsten.

Q. (4) Is it a fact that a tree will live longer if grafted on the whole root as it comes from the seed?

Ans. No. An apple tree will not live as long on a whole seedling root as it will on a piece root-graft if short root and long scion are used.—A. D. Barnes.

Ans. If the seed is planted where the orchard tree is to stand and top grafted or grafted at the collar and never dug, it is more favorable for a healthy long lived tree; there is no whole root system if the tree is ever pulled or dug.—Geo. J. Kellogg, Lake Mills, Wis.

Q. (5) Who has tried irrigating strawberries in this state and with what success?

Ans. Wells Bros., of Milton also parties at Sparta, Wis., with varying success. Generally the supply of water has not been sufficient. Irving Smith has used city water for irrigating when gardening at Green Bay.—Geo. J. Kellogg.

Q. (6) Which is the most suitable package for marketing apples in Wisconsin, the basket, barrel or box?

Ans. I prefer baskets to any other package. Purchaser can see goods.—A. D. Barnes.

Ans. The basket for choice early apple. The box for extra choice apples that command a fancy price. The barrel for No. 1 good marketable stock for long shipments.—Geo. J. Kellogg.

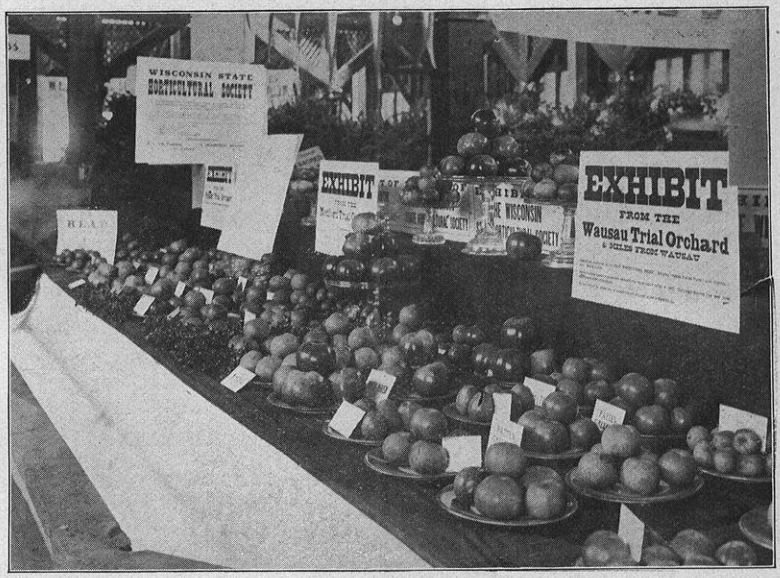
Ans. In barrels, (new).—A. J. Phillips.

Q. (7) Would it pay to grow grapes for market in Central Wisconsin on favorable sites?

Ans. Yes. If you confine the varieties to extra early sorts but it will not pay to compete with the Lakeshore, with Concords unless they can be ripened early and sold before the eastern crop comes on the market.—Geo. J. Kellogg.

Ans. In my opinion it will.—W. H. Hanchett.

Q. (8) Which is the best paying crop for a series of years; strawberries, raspberries or blackberries?



Portion of 1908 State Fair Exhibit.

Some prize apples at the Wis State Fair, 1908.

Ans. Strawberries bring the quickest returns, but you need Raspberries and Blackberries to prolong the season and hold the pickers. For short answer I would say—all three are best.—Geo. J. Kellogg.

Ans. In my experience the blackberry has paid best but this is a matter of location and the small fruit grower should grow them all.—W. H. Hanchett.

Q. (9) Tell exactly how pines and arbor vitaes may be grown about our homes in city or country?

Ans. Evergreens should be planted in spring as soon as soil is in proper condition for general planting. The roots should not be permitted to become in the least dry between the time of taking up and replanting. This precaution against root drying is even more necessary with evergreens than with other trees and shrubs. When planting, the soil to be placed about the roots must not be dry nor yet muddy. There must be no open places among the soil about the roots. If the trees when established are inclined to make too open growth the leader and overgrowing side branches should be shortened. Mulching is desirable for evergreens and if the young trees are small when planted out, a temporary shading. Be very careful not to plant evergreens too near walks, drives, other trees or buildings and never between the house and a desirable view for it is not well to remove lower branches from evergreens.—Wm. Toole.

Q. (10) What is the best variety of tomatoes to grow for the canning market?

Ans. New Stone, Matchless and Beauty in order as named.—M. V. Sperbeck.

Ans. We are not packing tomatoes at any of our Wisconsin plants and therefore are not in a position to give you information as to the seed best adapted to this climate. We are however operating a tomato plant in Indiana where our experience leads us to believe that the Livingston is the best tomato for the main crop. We use a small amount of the Perfection in certain cases.—Waukesha Canning Co.

Q. (11) What are the best varieties of sweet corn, early, late, and medium, to grow for market?

Ans. Early, Ihrig's Nordheim; Medium, Perry's Hybrid; Late, Stowell's Evergreen.—M. V. Sperbeck.

Q. (12) What is the best fertilizer outside of barnyard fertilizer for cucumbers? Is land plaster a benefit to cucumbers?

Ans. Cucumbers need a complete fertilizer as a general rule. There are conditions of soil where a complete fertilizer will not be required, but generally speaking it is best to apply a fertilizer composed of nitrogen, potash and phosphorous. A good mixture would be the following per acre: 150 pounds nitrate of soda, 200 pounds sulfate of potash, and 300 pounds of dessicated bones. If small quantities are needed, a tablespoonful of nitrate of soda, two of potash, and three of bone meal may be added to each hill, but it is better to mix these with some soil before they are applied, and be careful not to put these too close to the stem of the plant.—Prof. E. P. Sandsten.

Ans. Would say land plaster is a benefit and hard wood ashes well mixed with the soil is good.—M. V. Sperbeck.

Q. (13) What is the best remedy for the little striped bugs on cucumbers?

Ans. A mixture of land plaster and Paris green, 100 lbs. plaster, 1 lb. Paris green or that proportion sifted on the vines is the best remedy I know of. Use a common flour crank sieve. Dust during bug season.—M. V. Sperbeck.

Ans. A little striped cucumber beetle can be kept in control by the use of arsenate of lead at the rate of 3 lbs. to 50 gallons of water. For small quantities, the same proportion of poison may be used. We advocate the use of arsenate of lead because it will adhere and is not easily washed off by rains. The application must be made quite frequently in order to be effective.—Prof. E. P. Sandsten.

Q. (15) Are dry powder sprayers a success?

Ans. No.—Prof. E. P. Sandsten.

Q. (16) Please state the best remedy for shot hole fungus, especially on cherry trees, when and how applied in order to retain healthy foliage till frost time?

Ans. The shot hole fungus on cherries can be controlled by spraying with Bordeaux. The first application should be made when the buds are open and the second when the leaves are nearly full grown. This is the most critical time as the fungus gets its work in about the time the leaves are full grown. It

may be necessary to make three applications, but ordinarily two are effective against this disease.—Prof. E. P. Sandsten.

Q. (17) Does our state inspection law meet the requirements of the planter of nursery stock, or the nurserymen, and if not, what are its defects?

Ans. No. Imported goods—not home grown goods—need inspection. Better leave out inspection and compel spraying and destroying of blighted trees and varieties subject to blight.—A. D. Barnes.

Ans. The inspection law fails in that it does not guard against introduction of injurious insects and diseases from other states to the grounds of amateurs.—Wm. Toole.

Q. (18) Does the state law requiring the nurserymen or dealer in tree or plant life, to state where everything is fully grown, serve the purchasers' welfare or punish those who willfully disobey its command?

Ans. The state law requiring statement of where stock is grown is unnecessary and punishes honest nurserymen.—W. Toole.

Q. (19) Does it pay to apply sodium-nitrate to strawberries just as the berries are starting to ripen, or a little before, when you have barn-yard manure which was applied in the spring quite heavily?

Ans. It does not pay to apply nitrate of soda to strawberry beds if the beds have been fertilized with barn-yard manure in the spring. Still, good results have been obtained by the use of nitrate of soda when the berries are one-half grown. It will do little good unless the weather is sufficiently moist to get the nitrate into solution. If the strawberry bed has been heavily manured with barn-yard manure, the application of nitrate of soda is not profitable or advisable.—Prof. E. P. Sandsten.

Ans. If heavily manured don't apply sodium nitrate at all; if it is needed apply in early spring.—Geo. J. Kellogg.

Q. (20) When is the proper time to spray for apple tree aphis?

Ans. The best time to spray against tree aphis is when the leaves are from one-half to two-thirds grown. The young lice have just hatched and are very soft and easy to kill.—Prof. E. P. Sandsten.

Q. (21) What can be done to exterminate the contract orchard schemer? The man who collects more than a fair price on delivery and either one-half the fruit the fifth year or from 17 cents to 35 cents per tree?

Ans. In my town and in Norwalk they charged about 37½c per tree on delivery and then took notes for as much more in 5 years without interest when by inquiring of men who were posted they could have bought good trees for 25c each. A certain class want to be humbugged and its no use to try and help them.—A. J. Phillips.

Ans. Sustain the work of the State Horticultural Society in that line and keep the secretary informed. Induce people to become members of the society and promote the diffusion of more horticultural knowledge.—Wm. Toole.

Q. (22) Cranberry vines when left exposed through the winter, suffer from what is known as winter killing about the same as strawberry vines, blackberry and raspberry bushes and peach trees, and sometimes apple trees. What is the cause of this, the low temperature, or the continued dry winter winds? What are the conditions that favor winter killing and what can the grower do to prevent it?

Ans. In reply to the 22nd question I would say that in the case of the winter killing of cranberry vines, it has been quite conclusively proven at the Cranberry Experiment Station during the past year that the chief cause of injury to vines is lack of proper protection, or, in other words, exposure to severe weather. At the Experiment Station portions of the ground had been growing vigorous vines for seven or eight years without any additional sand in which the vines could set root, consequently leaving somewhat of a mat on the surface. A number of the same plots had been sanded in March, 1905, the depth of sand applied being from one to two inches. During February, 1908, the winter flood, which is the customary winter protection for the cranberry, was by some means allowed to get away from the Station, and no further protection could be applied until after the spring rains. Consequently portions of the Station were exposed during very severe weather the latter part of February, and the result was a great deal of winter killing on vines which had had no sand applied during the last seven years. On the plots which had been

sanded, although suffering slight injury, the demarkation was so clear that it was very conclusive evidence that the winter killing had chiefly been due to exposure to severe weather during February, and this undoubtedly can also be considered due to some extent to the very dry, cold winters of the Central section of the state, causing very rapid evaporation, while the sap flow undoubtedly was unable to supply the vines fast enough to make up for the evaporation, with results as above stated. The only remedy in the case of the cranberry would be to insure an ample winter protection by means of good floods and water supply at hand that will enable the application of any extra water when the flood has disappeared by seepage.—O. G. Malde.

Q. (23) Would it not pay to maintain at the Agricultural Department of our University a Plant Pathologist who would be free to work outside the University in teaching our farmers and horticulturists the best methods for combating the diseases of cultivated plants? If so, should not a bill for that purpose be introduced at this session of our legislature?

Ans. There should be a chair of Plant Pathology connected with our Agricultural College. Also an Entomologist and it is our duty to see that our legislators make proper provision for their establishment and maintenance.—Wm. Toole.

Q. (24) What are the best six varieties for a commercial apple orchard in Wisconsin?

Ans. Duchess, Wealthy, N. W. Greening, Malinda, McMahan and Hibernal in the far north. Southern part Fameuse.—A. J. Phillips.

Ans. Duchess, Wealthy, McMahan, Lowland Raspberry, N. W. Greening, Okabena.—A. D. Barnes.

Ans. Duchess, Wealthy, N. W. Greening, McMahan, Snow, Dudley. There are others perhaps as good. The Dudley is not propagated extensively yet but promises to become a commercial variety of considerable value.—D. E. Bingham.

Ans. Lowland Raspberry, Duchess, Wealthy, Plumb Cider, McMahan & N. W. Greening.

Q. (25) What is the best commercial fertilizer for general use in a garden, both vegetable and fruits and what quantity should be used?

Ans. The use of commercial fertilizers in connection with

gardening in Wisconsin is not profitable nor ordinarily advised. What our garden soil needs is humus or vegetable matter and commercial fertilizers will not supply this substance. Phosphorous is generally the chief element lacking and for this reason the treatment with dessicated bones is more beneficial than the application of any other fertilizer.—Prof. E. P. Sandsten.

Ans. So much depends on the needs of the particular soil in question that I would not care to advise. The chances are that some brand containing all of the three most necessary elements would in most cases give best results.—W. H. Hanchett.

Ans. *Potato Phosphate* for fruits is best we know. 500 lbs. per acre. No one can tell without trial on your own ground and that very judiciously. Pres. Cook of Michigan said *Acid phosphate* at the rate of 500 lbs. per acre. Ashes are good only on light soils. There is no fertilizer equal to stable manure which has been kept under cover and the liquid preserved with the solids. Keep it covered unless applied fresh. Geo. J. Kellogg.

Q. (26) After top-working young hardy apple trees, by "budding" how many of the small twigs below bud on limb should be removed the first year, or should they all be left on?

Ans. In top grafting, work only one third of the tree each year and watch the suckers. Don't let them rob the scions. I don't push the grafts too rapid so as to produce a tender growth.—Geo. J. Kellogg.

Ans. About half and balance the 2nd year.—A. J. Phillips.

Q. (27) Will stripping the leaves from young apple trees, of rather tender varieties, early in the Fall, prevent Winter killing of the tips of limbs to any extent?

Ans. Yes. Most assuredly if done at right stage of maturity.—A. D. Barnes.

Ans. Yes. Taking off the leaves will ripen up the wood.—Geo. J. Kellogg.

Ans. The removing of leaves of a tree is an injury and will cause winter killing rather than prevent it.—D. E. Bingham.

Q. (29) What culture is necessary for horseradish to obtain large roots? What soil? What size roots to plant? How long from time of planting to time of digging?

Ans. Plant on very rich land.—A. J. Phillips.

Ans. The culture of horseradish should be thorough. The soil should be a very rich, sandy loam. Medium sized roots 6 inches long should be planted in spring and dug the next fall.—M. V. Sperbeck.

Q. (30) Can we dig up strawberry plants and immediately reset the ground and secure a good stand of plants?

Ans. No. The ground should be worked two years at least with hoed crops.—Geo. J. Kellogg.

Ans. It can be done but is not advisable.—W. H. Hanchett.

Q. (31) Can a pedigree be established for a strawberry plant with named parentage?

Ans. Yes if the parentage is known beyond doubt and an association of some kind is organized to decide on and record this parentage. It appeals to me as a useless proceeding however.—W. H. Hanchett.

Ans. This is a mooted question. I have never found anything in favor of Pedigree Plants from Kellogg of Michigan though I have given them careful trial twice; plants should be carefully grown from new settings and never taken from bearing beds.—Geo. J. Kellogg.

Ans. A pedigree can be established for a strawberry or any other plant if its ancestry is known and recorded but to call the continued increase of the same variety the establishment of a pedigree is an erroneous application of terms.—Wm. Toole.

Q. (32) If not can a firm truthfully list all plants as thoroughbred pedigree plants?

Ans. A firm advertising all plants as pedigreed plants as that term is generally understood is using deception, but where the firm explains in its advertisement what they wish the public to understand as their application of the term, there is no deception provided their plants are selected according to their interpretation of the term.—W. H. Hanchett.

Ans. No.—Geo. J. Kellogg.

Ans. The answer to No. 31 answers this question also.—Wm. Toole.

Q. (33) Who knows anything about the so-called Wisconsin Spy apple?

Ans. The Wisconsin Spy was originated by Henry Johnson of the Town of Eden, Fond du Lac Co., Wis. Was dug up by

Johnson and planted in orchard. Was propagated by Clarke Hewitt of Waupun, Wis., quite extensively for a few years. Now discarded and not given in lists of Wisconsin varieties.—A. D. Barnes.

Ans. I have fruited it for 15 years on trees bought of Hewitt at Waupun near where it originated. Have fruited it top worked for 8 years and never had but one satisfactory crop. Fruit is, when matured, good in quality and is attractive in barrel.—A. J. Phillips.

Ans. Mr. A. D. Appletree Barnes.

Q. (34) Where are the thousands of trees of this variety, which are sold in Wisconsin by eastern nurseries, propagated?

Ans. I don't think there are any trees propagated. Believe they are put out under a fictitious name or by mistake.—A. D. Barnes.

Ans. God only knows and I do not think he troubles himself much about it.—A. J. Phillips.

Ans. Don't know.—D. E. Bingham.

Q. (35) Is there a fall bearing strawberry that can be recommended?

Ans. Yes. Pan America and Autumn.—Geo. J. Kellogg.

Q. (36) Is the Haymaker raspberry hardy in Wisconsin and is it superior to the Columbian?

Ans. In my experience the Haymaker raspberry is about the same as Columbian as regards hardiness but not its equal for quality.—W. H. Hanchett.

Ans. I don't think Haymaker is as hardy as Columbian or any better. It is not grown much in the west. Columbian needs protection in hard winters but if killed back to within 1 foot of the ground it will often give a paying crop.—Geo. J. Kellogg.

Q. (38) Do electrical storms injure the foliage of fruit trees?

Ans. No.—Prof. E. P. Sandsten.

Ans. Of course if the electricity comes in contact with the foliage or close enough to burn the leaves.—A. D. Barnes.

Q. (39) Should fruit trees from southern nurseries be planted in Wisconsin? Will they do as well as northern grown trees?

Ans. No, not in my experience.—A. J. Phillips.

Ans. Trees from southern nurseries if true to name and not overgrown are all right for Wisconsin if properly handled from and to digging and planting. If carefully handled the trees grown nearby have the advantage of less exposure. Our home grown trees are seldom over grown, often not well grown. If the buyer is a judge of well grown nursery stock he may safely accept good stock which has been grown outside of the state.—Wm. Toole.

Q. (40) Is it profitable to thin the fruit on trees that overbear? If so, when and how?

Ans. Yes. The thinning should be done when the apples are about the size of a small crab apple or immediately following what is known as the June dropping.—Prof. E. P. Sandsten.

Ans. Yes. It will pay to thin fruit. Start thinning as soon as it can be determined what is going to develop, picking off small imperfect fruit spacing to about 2 to 3 inches. Use ladder and keep at it. It will pay.—D. E. Bingham.

Q. (42) How about the Wragg cherry? Is it hardy in the southeastern part of our state? Is it a large black cherry? Is there a better late black cherry for this section of our state?

Ans. I am disgusted with the Wragg cherry. Not hardy for our county. Neither do I know of a black cherry that is hardy or productive in Wisconsin. —A. D. Barnes.

Q. (43) What is the best spraying outfit for a farmer's orchard?

Ans. The best spraying outfit is a barrel spray pump and will cost anywhere from $12.00 to $24.00.—Prof. E. P. Sandsten.

Q. (44) Is the brandywine raspberry a good variety for the farmer's garden?

Ans. Yes. Brandywine is choice. Midseason and productive. Turner, Miller, Ruby and King are earlier and in some points better. Loudon and Cuthbert are later and better near market.—Geo. J. Kellogg.

Q. (45) Of the two varieties, which is best, the Miller or Turner raspberry; first, as to yield; second, quality?

Ans. Miller is better quality and yield about like Turner. It is the manner of growth that makes the yield, the man behind the cultivator and the man that applies the manure.—Geo. J. Kellogg.

GEO. J. KELLOGG.

THE ONLY LIVING CHARTER MEMBER OF THIS SOCIETY. THE FOLLOWING IS AN EXTRACT FROM A LOCAL PAPER OF MARCH 21ST 1908.

Extract from Janesville Gazette: Yesterday, March 20th, (1908) was the 80th birthday of George J. Kellogg, who has lived in Janesville since 1852. The story of Mr. Kellogg's life recalls the times when this part of the country was new and mostly unsettled, and when Indian raids in the West were an ever present danger and the prairie schooner was the usual method of transportation across the Great Plains. He crossed the Great Plains in '49 driving five yoke of oxen, dug gold in California and returned to Wisconsin by way of the Isthmus of Panama. Appended is a letter from Mr. Kellogg.

Janesville, Wis., March 20, 1908.

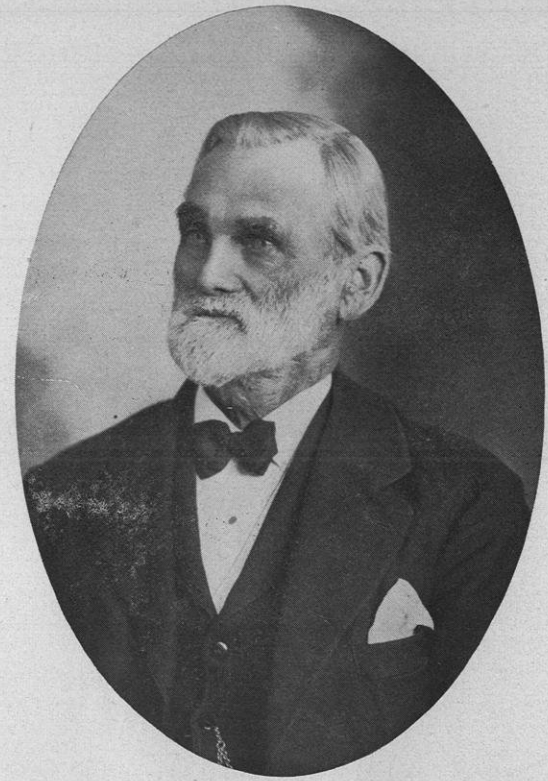
Editors Gazette: I am rejoicing in a shower of four-score birthday letters. I was born in Cicero, N. Y., and received my first education in Fulton, N. Y.; emigrated to the Indian land of Wisconsin, Aug. 2, 1835; graduated under the tutorship of our lamented Gov. Harvey at Kenosha, Wis.; spent 2 years in Wisconsin pineries; taught school two winters; drove five yoke of oxen across the plains to California in 1849; dug gold in California three years, took out about $15,000; returned home by the isthmus in 1852; located in Janesville and went into the nursery business "indoor" and out; have made something of a success of horticulture; turned over my nursery and business to my two boys, L. L. and M. S. Kellogg, in 1899, who are just making things hum. I moved to Lake Mills, quit work, set out a quarter of an acre to 70 fruit trees (grafted one older tree to 40 kinds of apples), 30 grape vines, 80 varieties of strawberrries, $200 worth of ginseng, lots of other fruits, took 35 first prizes at Jefferson county fair 1907, and am hale and hearty, with not an ache or a pain.

Read all my letters today without glasses as I am writing this.

GEO. J. KELLOGG.

J. Mills Smith.
(The oldest young member.)

Born at Green Bay, Wis., April 23d, 1901. Photo Feb., 1909. Son of Irving Smith and grandson of the late J. M. Smith of Green Bay.



Geo. L. Kellogg, Lake Mills, Wis.

Our youngest old member.

STATISTICS OF FRUIT, SPARTA REGION 1908–9.

The number of acres of strawberries to pick during the season of 1909 will be about 350.

The number of acres of red and black raspberries will be about seventy-five, Blackberries about 90.

The number of acres of grapes set out during the season of 1908, about 10 acres. This acreage due largely to the establishing of the trial vineyard here by the Wis. State Hort. Society.

The number of carloads of berries shipped during the season of 1908 was one hundred and sixteen, of all kinds of berries and fruits. The amount received for fruit shipped through the Association, net to Growers, F. O. B., Sparta was $72,624.25.

REPORT OF DELEGATE TO MINNESOTA.

C. L. RICHARDSON.

The 42nd annual meeting of the Minnesota State Horticultural Society occurred in Minneapolis Dec. 1–4, 1908. I counted 268 people in their places Wednesday afternoon. The membership was reported as 2812. More women are present than at the Wisconsin meetings. The large attendance is due to the place of meeting, which draws from St. Paul and Minneapolis, but still more to the enthusiasm and pertinacity of the country members, who gather from all parts of the state for the annual Reunion.

The apple display looked natural to a northern Wisconsinite. While the Wealthy is the leading apple, the main topic of discussion, the new seedlings, etc., were this year directed to the Malinda. Its keeping qualities were highly praised. Top-worked upon Duchess, it showed a 1-3 increase in size, its productiveness was far beyond that usually shown, while there was no loss in color or keeping quality. Apples of 8 oz. were produced. Cions were hardier; and grafted trees began to bear

at three years, instead of at nine or ten years of age. Malinda topworked upon Hibernal produced somewhat similar results but the increase in size and productiveness was not as marked as in the former instance. The Gould and Alaska crabs seem to be popular for grafting purposes. The Russian varieties are more in evidence than at Wisconsin.

Eight hundred seventy-eight plates of apples were shown. Owing to the extremely bad season the display was disappointing. The apples upon the single plates were small, a large percentage were wormy, curculio marks and limb bruises were abundant and moth-patches were common. Among the apples entered in peck and bushel lots, it was only occasionally that a perfect specimen could be found. A fine array of top-worked varieties were presented, also a number of Malinda seedlings. One, a seedling of Malinda and Wealthy is as large as the latter, solid and heavy, Wealthy in color, Malinda in keeping quality and shows its mixed parentage in shape. Quality hardly equal to Wealthy, it promises to be of great value.

The Plant Breeders Auxiliary, three years old, is doing good work. Apparently any one can belong who is growing seedlings; 226 members are enrolled, 17 of whom are doing hand-pollination; 112 members reported 10,763 seedlings, 3,000 of these are owned by one South Dakota member; 3,078 seedlings are entered for the $1,000 prize offered by the society for a seedling apple tree "as hardy and prolific as the Duchess" with fruit "equal to the Wealthy in size, quality and appearance" and "that will keep as well as the Malinda." A list of desirable crosses is being prepared so that members can take up whatever work appeals to their taste or environment. Not content with this Minnesota has started on the hunt for a hardy pear tree.

Mr. Patten of Iowa reported over 9,000 seedlings, and has crossed the black and English walnuts. The Excelsior Experiment Station has 325 pots of strawberries under glass for cross-pollination next year, 1,650 strawberry seedlings, 11,000 apple seedlings, 32,300 seedlings of all kinds besides 36,750 Gould crabs for grafting stock. If there be any reward for intelligent, sustained effort, Minnesota ought to evolve many things of value.

A demonstration was given of the physical and chemical analysis of soils. Special attention was called to the importance

to the soil of its medium-sized particles or silt. The Iowa Delegate spoke of the value of southern-grown seeds, on account of their lateness. Minnesota is opposed to "free seed-distribution" and urges a concerted effort to abolish the practice. The Secretary was instructed to draw up a bill to go before Congress establishing a standard quart box and other fruit packages.

The Minnesota State Bee-Keepers Society held their annual meeting Wednesday and discussed "The Fascination of Amateur Bee-Keeping," "Foul Brood" and kindred entomological topics.

Various phases of Improvement work were considered by the Womans' Auxiliary—a branch of the Horticultural Society consisting of 172 Woman's clubs throughout the state with a membership of nearly 8,000. Last year the Auxiliary distributed some 6,000 apple-trees to school children as an accessory to Arbor Day. They believe that bare school grounds and unsightly alleys only educate a child for the penitentiary, and that the surest way to interest the parents is to enlist the children.

That portion of the program devoted to flowers was held under the auspices of the Minnesota Rose Society. Outdoor Roses, Blubs, Dahlias, Perennials and many other flowers were included. A practical garden dress complete, from laced tan shoes to wide brimed straw hat was worn by one bright energetic little woman as a practical demonstration.

Unique among the papers was an appreciation of John Chapman (Pennsylvania 1787) better known as Johnnie Appleseed the pioneer who spent his life throughout Pennsylvania, Ohio and Indiana planting apple seeds in that then untravelled waste.

The three lantern talks were unusually good. "Minnesota Forests and Gardens," "Possibilities of Cranberry Culture" and "Our Duty Toward the Landscape." There are thousands of bog-holes in Northern Wisconsin ranging from a few square rods to several acres in extent which might be utilized for the intensive culture of cranberries.

The strawberry session was brief, being confined to "Small Fruit Culture in the Pine Regions of Minnesota," a valuable exercise on "Strawberries" by Geo. J. Kellogg and a few "Suggestions" by your Wisconsin delegate.

Wednesday evening occurred the Annual Banquet, similar in general plan to our own. Perhaps 200 people were present. The hall was elegant, the menu excellent and the toasts unduly long.

In consequence of its proximity to the great treeless plain, Minnesota has early been compelled to face the problem of forest preservation and extension. The program presented by the Minnesota State Forestry Association, was terse, interesting and full of facts. While 700 square miles of the Cass Lake Reserve were burned over, intelligent forestry has practically eliminated the danger to life and standing timber. In the areas where logging was done, all tops, limbs and refuse was burned. The cost was but 12c to 25c per thousand feet. The average cost of inspection and protection was $115.20 per township containing on the average 36 million feet valued at $80,000. The cost of protection can be reduced to $100 per year per township—which is remarkably cheap insurance. While the forest area is increasing, the burned area and the amount of loss are rapidly decreasing. The loss in 1907 was but $31,000.

Four short talks were given by young men from the State School of Forestry, including work at Itasca Park, Among the Sand Hills of Nebraska, In a Montana Lumber Camp and In the National Forests of Montana. The work includes pacing, mapping, chaining, use of compass, surveying, estimating, strip valuation, location of corners, etc., thinning, germination, protection of seeds, seed beds and some botany and entomology. For the arid western areas these trees were recommended: Yellow pine, bull pine, white spruce, Colorado blue spruce, Scotch pine, white fir and arbor vitae. For the general good 15 to 20 per cent of the land area should be covered by forests. It was suggested that the U. S. forestry service take up the problem of supply of good forest seeds.

There would seem to be here a legitimate, and as yet unentered, field for the work of our Society. Your delegate respectfully submits that our Society might serve as an official center about which the interests of forest conservation might gather in Wisconsin.

"More fruit and less wood" was a plea for enlightened methods of tree-culture. Our present modes of fertilizing, spraying and cultivation tend to become mere nitrogen-creating

or freeing processes. Hence the wood and fruit buds produced are soft, crass and unripened. Irregular nutrition leads to irregular crops. We must feed a balanced ration to secure a balanced product. The ration must be balanced in *available* plant food. Many plant foods are so nearly insoluble, or in such chemical form as to be available only after the lapse of 50 or 100 years. We have all studied the gospel of the Insoluble—but it belongs in the Apocrypha. The surest way to know the correct ration is to experiment with two out of the three—nitrogen, phosphoric acid and potash—in varying combinations until a satisfactory result is attained.

One veteran orchardist, after half a century of experience, laid down the rule that while clay is a valuable adjunct to orcharding, any location that will raise wheat will raise apples.

It was proposed to organize a Shippers Protective Association and prosecute all just claims against consignees and carriers to the end. It was also suggested that all growers and dealers in nursery stock be registered, licensed and bonded for an amount sufficient to cover all loss due to their carelessness or false representations.

The outlook for plums in Minnesota is not regarded as promising. The American varieties are all unsatisfactory and the opinion was expressed that ultimate success must be attained, if at all, by crossing with the European and Japanese plums. In answer to a question as to the best varieties the plum expert said "none of the varieties are the best. I can not recommend any of them." The enemies of the plum have only recently become active in Minnesota and their restriction or extirpation is still in the experimental stage.

Pruning was taken up at considerable length, including Pruning the Orchard, Pruning for Fruitfulness by A. D. Brown of Wisconsin and the pruning of small fruits, shrubbery, shade and ornamental trees. As unpruned trees incline toward the northeast the cutting back must occur on that side. Winter apples such as Newell and Northwestern Greening which are shy bearers can be persuaded to yield by girdling the limbs—but not the trunk—perhaps three-fourths of the way around. By pruning June 15–July 15, fruit buds can be developed for the following year. There is danger of canker getting a foothold at the places where girdling occurs.

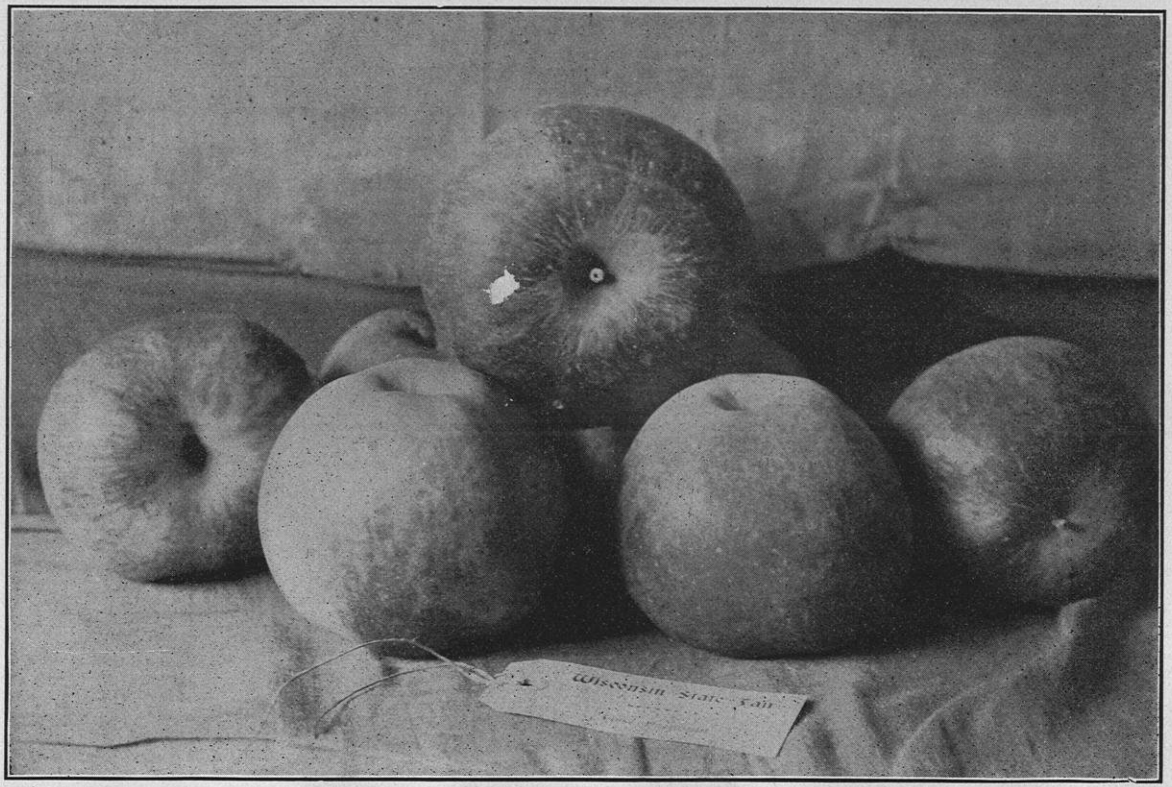
Pruning of shade and ornamental trees is either to make the tree conform to the available space, to permit access of sun and air, to remove dead and diseased wood, to redress storm injury, to stop the ravages of age and neglect or to prepare and balance the tree for change of location, and its nature and amount must depend on the object desired.

The final session was devoted to spraying and topworking, including a demonstration of the preparation of bordeaux mixture. Ten years experience in its use, Two years spraying at Experimental Station, Arsenate of Soda as an Insecticide, A Ten Years Experiment in Top-working and notes from the long experience of the Wisconsin veteran, A. J. Phillips.

A convenient way to prepare bordeaux is to make stock or saturated solutions of lime and copper sulphate. One gallon of water will dissolve 3 lbs. of copper sulphate or 2 lbs. of lime. Knowing this rule the desired amount can be measured out at any time. Either solution will keep all summer. Never mix the stock solutions in concentrated form; they settle too rapidly. Dilute one or both before mixing. It is best to dilute the copper sulphate solution to its normal strength then add the lime solution about 2-3 diluted, then add more water. In other words pour the partially diluted lime into the fully diluted copper sulphate solution. The resulting solution may be tested by adding a solution of potassium-ferro-cyanide. If a dark reddish-brown precipitate is formed add lime until no change occurs. Then the solution is complete or neutralized. The following strengths were recommended.

	lime lbs.	copper sulphate lbs.	water gals.
Japanese plums	3	3	50
Raspberries and strawberries	5	5	50
Apples	4	4	50
Potatoes	6	6	50

For Potatoes arsenate of lead was recommended, 3 lbs. to 50 gals. water. Pour the copper sulphate solution in the barrel, mix the lead and lime solutions and pour in the barrel. Any good test for iron will detect the sulphate or iron if the sulphate of copper be adulterated with it. Very good results have been obtained where one man owns a spraying outfit and does the spraying for the entire neighborhood. The dust spray has been tried. It has proved to be an unmitigated fail-



First Premium Wolf River Apples, at Wisconsin State Fair, 1908.

ure. Some spray as buds open and a second time when petals fall. Some also spray ten days later.

Paris green is losing favor. Arsenate of Soda is recommended. To one pound white arsenic add four pounds of sal-soda crystals and boil until dissolved in two gallons of water. This is equal to two pounds of Paris Green. One pound of arsenate of lead to 40 gals. water was said to be an efficient poison. When once dried upon the plants arsenate of lead will withstand considerable rain. Its presence was detected last summer six weeks after application. Arsenate of soda is cheaper and can be used half-and-half with arsenate of lead very satisfactorily. The Vermoul nozzle is a favorite, others may be better but they clog oftener. In spraying, a pressure of 60 to 120 pounds is necessary.

San Jose scale, it was claimed, does not exist in Minnesota. It has been imported several times but does not endure the winters.

Plum orchards are being sprayed with good results. Trees 5–10 years old, sprayed 1907 and 1908 with copper sulphate 3 lbs. lime 4 lbs. arsenate of lead 3 lbs. water 50 gals. resulted as follows:

Unsprayed, 53% fruit marketable.
Sprayed 2 times, 62% fruit marketable.
Sprayed 3 times, 77% fruit marketable.

Another Test.

Unsprayed, 40% fruit marketable.
Sprayed 2 times, 62% fruit marketable.
Sprayed 2 and 3 times, 74% fruit marketable.
Sprayed 3 times, 86% fruit marketable.

Cost of spraying 10c to 15c per tree. Thus it is cheaper than jarring the trees. Hogs, chickens or geese will destroy the windfalls—this is very important. Where sprayed no adult curculios were formed. Bordeaux reduces plum rot and plum pocket.

It was a great meeting, the only trouble was—there was too much of it.

REPORT OF THE MADISON HORTICULTURAL SOCIETY, 1909.

G. W. REIGLE.

It is a well known fact that the Madison society enjoys the enviable reputation for being the oldest horticultural society in the state; for being located in the most beautiful city of the west, a city noted for its enterprise, its culture, its wealth and its hospitality.

With the idea that such environment would afford a fertile field for horticultural activities, the president and secretary of our society secured in about one hundred minutes, one hundred dollars which were to be awarded in premiums for the best vegetable gardens made during the summer.

Limitations governing the size of the gardens were imposed, thus affording an opportunity for the children of the public schools to enter the contest without being handicapped by their elders. Forty-two cash prizes were offered varying in amount from one dollar up to fifteen dollars.

Early in the season, a campaign of education was decided upon, which should embrace first, the lecture second, the demonstration and third, a round-table conversation of question and answer. The above was supplemented by the distribution of nearly five hundred government bulletins, treating on amateur gardening in general and also bulletins treating on individual fruits and vegetables.

What do you think of our plan? At the time we considered that we had something quite original; we knew it to be logical and said it was perfect. Result. The gardens reported for competition were more difficult to find than the unknown quantities in simultaneous equations.

There were distributed to members one hundred and fifty hardy shrubs, viz., hydrangea grandiflora, spireas von Houteii, Berberis thunbergia, crimson rambler and rosa rugosa.

Perhaps the most important action of the society for the year was the purchase of fifty standard books on gardening, floriculture and horticulture. These volumes are new and up to date and will supply literature not usually found in city libraries.

A list of the books may be of interest to the readers of our reports.

Garden Making.
Gardening for Profit.
Gardening for Pleasure.
Gardening for Young and Old.
How to make the Garden Pay.
Market Gardening & Farm Notes.
Principles of Vegetable Gardening.
Plums and Plum Culture.
Home Floriculture.
How to Plan the Home Grounds.
Garden of a Commuter's Wife.
The Country Home.
The Home Acre.
A Woman's Hardy Garden.
Vegetable Gardening.
The Seasons in a Flower Garden.
Four Seasons in the Garden.
Biggle Berry Book.
The Spraying of Plants.
The Principles of Fruit Growing.
Field Book of American Wild Flowers.
Art Out of Doors.
Landscape Gardening.
Mary's Garden and How it Grew.
The Fat of the Land.
Three Acres and Liberty.
The Book of Vegetables.
The Farmers Garden.
Farming by Inches.
My Ten-rod Farm.
Flower Garden.
How to Make School Gardens.
$2,000 a Year on Fruit and Flowers.
The Practical Garden Book.
Gray's Field, Forest and Garden Botany.

We have about $300 in our treasury today and about $150 available funds should we decide to re-open our contests inaugurated last year. "And he said unto them, The harvest is plenteous but the laborers are few; pray ye therefore the Lord of the harvest that he send forth laborers unto his harvest."

REPORT OF COMMITTEE ON AWARDS.

Winter Meeting, Jan. 12–13–14, 1909.

Your committee on awards has examined the fruit on exhibition and make the following awards:

Best Collection: 1st John Reis; 2nd D. E. Bingham.

Best 4 Plates, winter: 1st John Reis; 2nd O. J. Burnham.

Best 3 Plates, winter: 1st John Reis.

Best New Apple: 1st John Reis; 2nd John Reis.

Best Seeding Apple: 1st J. W. Roe; 2nd E. S. Hildemann; 3rd J. W. Roe.

Best Plate Avista: 1st D. E. Bingham.

Best Plate Baldwin: 2nd Geo. J. Kellogg.

Best Plate Ben Davis: 1st Geo. J. Kellogg; 2nd John Reis; 3rd D. E. Bingham.

Best Plate Fameuse: 1st John Reis; 2nd O. J. Burnham; 3rd Geo. J. Kellogg.

Best Plate Gano: 2nd John Reis.

Best Plate Gem City: 2nd Mrs. Robt. Ramsey; 3rd A. D. Brown.

Best Plate Golden Russett: 1st John Reis; 2nd Geo. J. Kellogg.

Best Plate Hibernal: 1st John Reis.

Best Plate Longfield: 1st John Reis; 2nd D. E. Bingham; 3rd A. D. Brown.

Best Plate Malinda: 2nd Mrs. Robt. Ramsey.

Best Plate Mann: 1st John Reis; 2nd H. C. Melcher.

Best Plate McIntosh: 1st John Reis; 2nd D. E. Bingham; 3rd E. S. Hildemann.

Best Plate McMahan: 1st John Reis; 2nd D. E. Bingham; 3rd E. S. Hildemann.

Best Plate Milwaukee: 1st H. C. Melcher.

Best Plate Newell: 1st John Reis; 2nd D. E. Bingham.

Best Plate N. W. Greening: 1st O. J. Burnham; 2nd D. E. Bingham; 3rd Mrs. Robt. Ramsey.

Best Plate Pewaukee: 1st O. J. Burnham; 2nd Geo. J. Kellogg.

Best Plate Scott Winter: 1st O. J. Burnham; 2nd A. D. Brown; 3rd John Reis.

Best Plate Sutton Beauty: 1st D. E. Bingham.

Best Plate Tolman: 1st D. E. Bingham; 2nd John Reis; 3rd O. J. Burnham.

Best Plate Utter: 2nd John Reis.

Best Plate Walbridge: 1st John Reis; 2nd Mrs. Robt. Ramsey.

Best Plate Wealthy: 1st D. E. Bingham; 2nd John Reis; 3rd E. S. Hildemann.

Best Plate Windsor: 1st O. J. Burnham; 2nd John Reis; 3rd J. S. Palmer.

Best Plate Wolf River: 1st John Reis; 2nd D. E. Bingham.

Best Peck Fameuse: 1st John Reis.

Best Peck McIntosh: 1st John Reis.

Best Peck McMahan: 1st John Reis; 2nd D. E. Bingham.

Best Peck Newell: 1st D. E. Bingham; 2nd A. D. Brown.

Best Peck N. W. Greening: 1st D. E. Bingham.

Best Peck Wealthy: 1st D. E. Bingham.

Best Exhibit Pears: 2nd Geo. J. Kellogg.

Best Exhibit Grapes: 1st John Reis.

THIRTY-FIFTH ANNUAL REPORT

OF THE

WISCONSIN

Dairymen's Association

HELD AT

Tomah, Wis., February 20, 21 and 22, 1907.

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

COMPILED BY

GEO. W. BURCHARD, Secretary.

MRS. A. L. KELLY, Stenographic Reporter.

MADISON

DEMOCRAT PRINTING COMPANY, STATE PRINTER

1907

LETTER OF TRANSMITTAL.

WISCONSIN DAIRYMEN'S ASSOCIATION,

Secretary's Office,

FORT ATKINSON, May 20, 1907.

To His Excellency, JAMES O. DAVIDSON,

Governor of the State of Wisconsin.

I have the honor to submit for publication, as provided by law, the thirty-fifth Annual Report of the Wisconsin Dairymen's Association showing the Receipts and Disbursements the past year, also papers relating to the dairy interests read and discussions had at the annual convention held at Tomah.

Very respectfully,

GEO. W. BURCHARD,

Secretary.

OFFICERS, 1907.

PRESIDENT,
W. J. GILLETT,
ROSENDALE, FOND DU LAC COUNTY.

VICE PRESIDENTS,
HON. A. D. DELAND, SHEBOYGAN, SHEBOYGAN COUNTY,
President 1877.

PROF. W. A. HENRY, MADISON, DANE COUNTY,
President 1890.

HON. W. D. HOARD, FORT ATKINSON, JEFFERSON COUNTY,
President 1891-3.

HON. C. H. EVERETT, RACINE, RACINE COUNTY,
President 1894-5.

HON. H. C. TAYLOR, ORFORDVILLE, ROCK COUNTY,
President 1898-9.

HON. C. P. GOODRICH, FORT ATKINSON, WIS.,
President 1900-1.

HON. J. Q. EMERY, ALBION, WIS.,
President 1901-3.

CHARLES L. HILL, ROSENDALE, FOND DU LAC COUNTY.

SECRETARY,
G. W. BURCHARD,
FORT ATKINSON, JEFFERSON COUNTY.

TREASURER,
H. K. LOOMIS,
SHEBOYGAN FALLS, SHEBOYGAN COUNTY.

HON. CHESTER HAZEN, RIPON, FOND DU LAC COUNTY,
President 1872-74. Died 1900.

HON. HIRAM SMITH, SHEBOYGAN COUNTY,
President 1875-76. Died May 15, 1890.

HON. H. F. DOUSMAN, WAUKESHA COUNTY,
President 1878.

HON. Z. G. SIMMONS, KENOSHA COUNTY,
President 1879.

HON. C. R. BEACH, WALWORTH COUNTY,
President 1881-82 Died September 15, 1896.

HON. W. H. MORRISON, WALWORTH COUNTY,
President 1883-86. Died December 15, 1893.

HON. H. C. ADAMS, DANE COUNTY,
President 1887-89. Died July 7, 1903.

HON. STEPHEN FAVILL, DANE COUNTY,
President 1886. Died ——, 1906.

ARTICLES OF ASSOCIATION.

(Adopted February 15, 1872.)

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

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

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

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

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

ARTICLE VI. The regular annual meeting of the association shall be held each year, at such place as the executive board shall designate.

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

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

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

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

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Dairymen's Association

AT THEIR

THIRTY-FIFTH ANNUAL CONVENTION

Held in Tomah, February 20, 21, 22, 1907.

The Convention was called to order by Secretary George W. Burchard.

Sec'y Burchard: We never expect a very full attendance at the opening session of our conventions; this session is devoted largely to preparing the way for the business which follows.

I, in a way, very much regret that the President of our Association is unable to attend. He is that sort of a man that we are glad to show you, to advertise, but matters at his home in connection with dairying, which I will not now explain, are in such shape that it is not prudent for him to leave. I will call on one of his neighbors, and a Vice-President of the Association, to occupy the chair in his absence.

Vice-President Charles L. Hill called to the chair.

The Chairman: Ladies and Gentlemen, I assure you that my neighbor Gillett very much regrets that he is unable to be with you at this annual meeting of the Wisconsin Dairymen's Association. Mr. Burchard did not feel free to tell you what

kept him at home, because the matter in a way is a secret, but Mr. Gillett said he was willing you should know how important it is for him to be home. He is a breeder of Holstein-Friesian cattle, and he has under test at this time a Holstein-Friesian cow who has already pessed the two weeks record, the month's record and before this week is up will pass the sixty days' record for butter fat. He felt that it was important to the dairy interests of Wisconsin and of the country at large that he should be at home taking care of that cow. We are glad toknow that we have a man who is well enough known throughout the dairy circles of this State to be President of our Association here and who has been for two terms President of the American Holstein-Freisian Breeders' Association and is still milkng the cow and, indeed, is so closely tied up to that cow's tail that he feels that it would not be wise for him to come here to preside at this meeting. Mr. Gillett is milking the cow four times a day and has not missed a single milking in sixty days with the exception of one morning, when he was at the bedside of his mother, who was dying.

Mr. Gillett sent by me the very kindest regards and best wishes for this Association and for this meeting at this time and I presume he will be thinking of us at this hour.

We have with us the Mayor of the City of Tomah, who will at this time give us his address of welcome.

Mr. Chairman: I am beginning to think that Tomah is quite a Convention City, although, having served as Mayor but a short time, I have already been called upon to welcome the delegates to three different conventions.

Now, while I am averse to public speaking, I am always ready and willing to extend the official hand of welcome.

I believe it was Walton who said—"That doubtless God might have made a better berry than a strawberry, but doubtless he never did"—and I suppose I speak the sentiment of those present, when I say—God might have made a more useful animal than the cow, but doubtless he never did.

If I understand aright, the purpose of this Convention is to increase the usefulness of the cow, and as that self same animal turned last year through the channels of the local cream-

ery over one hundred thousand dollars into the pockets of the Tomah traders, I am sure we all appreciate her worth.

Gentlemen, it is with genuine pleasure we welcome you to our city. May your stay be both pleasant and profitable, and may you carry away pleasant recollections of Tomah and and of the 35th annual meeting of the Wisconsin Dairymen's Association.

If at some future convention the question should arise as to where your next meeting place should be, I shall expect to hear the words, "Tomah, Tomah, Tomah."

RESPONSES TO ADDRESS OF WELCOME.

C. P. Goodrich, Ft. Atkinson.

Mr. President' Ladies and Gentlemen: This looks to me as though they had got me into a little bit of a box, being called on suddenly to respond to such a fine address of welcome in Taylor's absence.

I want to say to you that this is not my first visit to Tomah; my first visit in this part of the country was fifty-one years ago and I don't think there was any Tomah here then, at least I didn't discover any. There was not a railroad in Wisconsin. I made my way on foot, looking for a location, a place where I could buy government land to make a farm out of, and I found some land, I can't tell you exactly where, but only a few miles from here that suited me very well. I started to go to the land office at La Crosse, and I ran across the stage somewhere along through here that ran from Mauston to La Crosse. The stage was pretty well loaded down, the roads were muddy and I was in a hurry to get the land, so I went on foot, and I beat the stage into La Crosse, but the next morning when I went to the land office as soon as I could get there, I was informed that the land had been entered the day before, and that must be the reason why I am not now a citizen of this part of the country. Even then I was welcome to the few settlers that were here. We considered it then a vast, unbroken,

almost trackless wilderness; the few tracks that were here, some of them I made.

So I knew we would be welcome here now. At that time I doubt if the average would have been more than a cow to five hundred acres. Now there are a great many.

You see I am talking along in a rambling sort of a way. I have known of gentlemen who could talk without thinking, their thinking machines stop entirely and their tongues run on, but mine won't work that way.

The Dairymen's Asociation was formed some thirty-five years ago and it has done wonders in pushing the cow industry in the State of Wisconsin. It has built up the southern part of this State, made the lands very valuable because it has made them rich and the cow has filled the pockets of the farmers with money and is beginning to do that somewhat in the further north. We can see that it is already doing it in this part of the country, and in the course of time, with the encouragement of the Dairymen's Association, the dairy industry is going to redeem the whole State of Wisconsin and make it the greatest dairy state in the Union, if not in the whole civilized world.

I know that we are welcome here and I thank the Mayor for his kind words.

My thinking machine is stopped and I will not let my tongue run on any longer.

C. H. Everett of Racine being called for, spoke as follows:

Mr. President, Ladies and Gentlemen: I am glad to be at Tomah this morning and to meet the dairy farmers of this vicinity, and I am glad to say a few words and hope to offer a little encouragement to them.

I have been an exponent of the dairy cow for a good many years, and have been engaged in the work of milking cows myself; most of my life I have spent as a dairyman. I have always been anxious and am still so to do something to help the dairy farmers of Wisconsin; to help them secure better results, to help them to see more clearly, to enlarge their vision and to raise them up so they may see how to help themselves.

Dairying is a matter of education very largely; it is a matter of good heart, common sense and thought. Our state is burdened with poor cows, and that more than anything else is what holds back the Wisconsin dairyman to-day,—the poor cows that he has on his farm. Our dairy farmers are too easy,

too careless, too slow in regard to the individual ability of their cows. They are broad in other ways, broader than other farmers in this state or any other state, and they are broader than the dairy farmers of other states, but not nearly as broad as they should be and as they can be.

Every farmer knows better than to sell a fat steer worth seven cents a pound for four cents, or a good fat hog worth six cents a pound for three cents. He knows a cord of hickory wood is worth more than a cord of poplar wood, but still a large majority of them seem to be content to put expensive feed into different cows and do not seem to think that it is important to know what kind of cows they have upon the farm; in other words, to test the cows and get their value, their ability to turn feed into money.

Now, a dollar's worth of feed put into a cow may render two dollars worth to the owner of that cow, and a cow in the same herd may not pay him back but one dollar. That has been demonstrated time and time again by Mr. Goodrich and many others in taking a cow census.

It seems to me it is a matter of common sense, a matter of pride, for a man to know which one of those two kinds of cows he has upon his farm.

Life is short at the longest, and many of you farmers, as I see you in front of me, are past middle age, you are going down hill; like myself, you are on a decline and a few more years will put us out of usefulness, and it seems to me it is too bad to spend the little valuable time we have, fooling it away on these indifferent cows,—at least, not to know something about our business, not to test these cows, to apply the Babcock test to them and find out what they are worth, and whether they pay for the feed that we give them; in other words, whether they pay for their board. I bought a Babcock milk test fifteen years ago or more, and it didn't take me long to find out that I had a lot of poor cows, cows that ate more feed than they paid for, and I got rid of them, kept the better ones, purchased a pure bred Guernsey sire and began to breed up, to improve my cows, until I got a herd that began to pay a profit.

It is simply a matter of business and a little energy, that is all there is about it.

I want to urge upon your farmers attendance at this con-

vention and to seriously consider what is going to be said to you here. It will come from men of experience,like Mr. Goodrich, men who have owned good cows and have become independent, some of them, and they have done it by having good cows and doing a little clear thinking, that is all, applying good business methods to their business.

This convention is for the milk producers of the state, the county and this vicinity, and you cannot afford to miss a single session of it, and we want you to take part, too. Tell us what you are doing, give us your experiences and if any of us can help you, we will be glad to do so.

PRESIDENT'S ANNUAL ADDRESS.

President W. J. Gillett, Rosendale.

(Read by the Secretary.)

Members of the Wisconsin Dairymen's Asociation, Ladies and Gentlemen: It is with pleasure that I extend to you greetings at the opening of this meeting.

One year ago you took advantage of my absence from your convention, and in electing me as your president, conferred an honor, the highest within the gift of the members of this Association. This is the first opportunity, gentlemen, offered me for publicly extending to you an expression of the grateful appreciation which I deeply and sincerely feel for the honor thus conferred.

With this meeting the Wisconsin Dairymen's Association reaches the thirty-fifth mile-stone in the history of its existence, and the good work accomplished by this organization during these years can not be easily estimated. Indeed, it has woven a mighty fabric which has spread over every dairy precinct of the state of Wisconsin and its far reaching influence has directly or indirectly benefitted every dairyman in the state, and so thirty-five years ago, when a small body of energetic, enthusiastic dairymen met at Watertown and affected

the permanent organizaion of the Wisconsin Dairymen's Association they "builded better than they knew."

We meet here at this time for the purpose of an exchange of ideas and to discuss questions which are of interest and importance to the dairy husbandman, and the program which is to follow is such that I believe no one can go home from this convention without taking with him some ideas—some knowledge that will be new and valuable to him.

We have every reason for taking a just pride in Wisconsin. A pride because of her high standing among the leading agricultural states of this nation; pride because of her rapid advancement in agricultural pursuits; pride because of the excellent character and wide reputation of her herds and flocks. and pride because of her public institutions for mental training and learning.

Wisconsin is looked upon as authority on dairy topics. The attention of the world is attracted to Madison; her young men and women have gone out into the world and hold many positions of responsibility and honor; representatives from her dairy herds will be found in every state from the Atlantic to the Pacific; at the World's Columbian Exposition and at St. Louis, in open competition with the world's fittest, no contestants were found "worthy of her steel," while later developments in the dairy performance of some of her animals, have challenged the most phenomenal yields of the world. Thus the high character of our purebred herds makes the avenues for improvement in the dairy cattle of the state more easy of access, and a practice of grading up can not be too strongly urged or too highly recommended.

Surely the pure bred sire is the salvation for all live stock improvement, and the fact that dairymen from the Pacific Coast, the Atlantic and Gulf states, Canada, and Mexico can afford to come to Wisconsin and pay high transportation rates upon sires selected to improve their herds, should serve as an eye opener to some of our own dairymen, who have heretofore failed to appreciate the influence and value of the improved sire Surely a sum of money thus invested is a most paying investment, and quality will endure and live on long after the purchase price is forgotten.

During the past few years the prevailing prices of dairy products have been very encouraging for profitable dairying

and there is positive proof of a general awakening of interest in the dairy industry.

The dairy cattle markets of the United States are continually clamoring for a higher grade of dairy products and cattle and more of them. On every hand dairy ability commands a price commensurate with the quality, and there is certainly little danger of over-loading the market for same years to come. These facts, aside from the advantages to be derived in his own dairy should encourage every dairy farmer in the matter of breeding and reaching out for animals of a higher standard of excellence.

During the past year this Asociation has entered into work which has for sometime been carried on in other states and in Canada.

Contemplating the good that might be derived from a practice of weighing and testing the milk of the dairy herds through-out the state, for the *entire period of lactation,* and to encourage the adoption of such a plan by every dairyman of the state, as well as to encourage the formation of Test Associations in different dairy precincts, this Association has two men in the field but since one of these representatives is on our program, I will say nothing as to what the results of this work have been further than to mention, that within my knowledge, there have been two herds sent to the shambles because of unfavorable disclosures this system of weighing and testing has revealed to the owners who by it found their cows were a bill of expense rather than a source of profit. Such conditions, which certainly prevail in many instances, leads to the thought, that a man to be a successful cow keeper, should learn his business, and for this purpose and as an educator the value of the scales and fat test cannot be ignored or their constant use neglected.

Know your herd, investigate the best methods of breeding, feeding, and care taking, and study the prevailing conditions that surround you, for our equipment will grow better with the application of a higher intelligence and a clearer understanding of our subject.

When the roar of cannon and the shriek of shell proclaimed the victory of Dewey at Manila Bay; when Admiral Schley vanquished Cervera's squadron off Santiago harbor; and when Admiral Togo met and destroyed the magnificent Russian fleet

in the sea of Japan, the laurels of victory came not alone through the equipment but through "the men behind the guns."

Although we take great pride in Wisconsin as one of the leading states in dairy husbandry, we have fallen far below the limit of our possibilities and our progress and advancement during the past two decades bespeak something of what the future holds in waiting for us.

It is sad, but nevertheless true, that the incentive that prompts the average man to action is the love of gain, his interest increasing or decreasing according to the size of the arc described in the swing of the pendulum of prosperity, but it is a pleasant thought that life holds out to us things dearer than wealth—a public benefactor—and help to our fellow men —an honor and a pillar of strength to the business in which we are engaged.

During the past year it hath pleased Almighty God to remove from our midst three of our most distinguished and honored members.

Stephen Favill, one of the ex-presidents of this Association, Congressman H. C. Adams, ex-dairy and food commissioner of the state of Wisconsin and a former president of this Association and Mr. Fred Rietbrock.

Mr. Favill's life ripened into a good old age. He was always a lover of agricultural pursuits, a thorough dairyman, enthusiastic, energetic, aggressive and ever ready to espouse the cause of dairying and assist in the advancement of the dairy interests in Wisconsin.

Mr. Adams' life was much given up to the cause of agriculture. He was a born leader of men, easy of approach, kind of heart, genial and beloved by all who knew him. His work in the different capacities in which he served reflect the high character and marked ability of the man. His services in the capacity of president of this Association, in the State Dairy and Food Commission and in Congress speak of that leadership and untiring energy characteristic of his life, and leaves behind a record that will be ever cherished by an appreciative constituency.

Mr. Rietbrock was an enthusiastic admirer of the dairy animal, a devout lover of agriculture, a noted breeder and a man whose influence we could little afford to lose.

In the passing of these three gentlemen, the voices that were

so often heard in the councils of this Association and for the advancement of the dairy interests, are forever hushed and it is with a mingled feeling of joy and sadness that we recall them in memory—joy because of the great good the efforts of their lives accomplished—and sadness because of their departure. It can well be said that the world has been made better by them; we cherish their memory and revere their names.

The Chairman: I feel sure that there are in that paper many things that we will wish brought to our attention, and I will appoint a committee for that purpose, consisting of Mr. A. D. DeLand, Mr. E. F. Wyatt, Mr. M. L. Wells. I want to speak of one or two things I noticed in Mr. Gillett's paper. He speaks of the "man behind the gun," and he ought to be competent to do so, because he is at present the "man behind the cow," and to secure such records as his cow is making at the present time, very much depends upon a man's personal attention. The other records made by Wisconsin dairy cows that he speaks of are now the talk of the whole world. Three years ago "Loretta D" brought to Wisconsin the laurels that she gained at the so-called "St. Louis Dairy Cow Demonstration." Two years ago "Yeksa Sunbeam" established a world's standard of fat record; making 857 pounds fat, equivalent to a thousand pounds of butter, and now my neighbor Gillett's cow has reached the magnificent yield of milk, last Sunday, of 106 pounds. She has given 28.4 pounds fat in a week, which with the one sixth added to the butter fat, would make close to thirty-three pounds of butter, and in thirty days she has given 110.13 pounds, being just slightly ahead of the previous Holstein-Friesian record. But she will probably yet add something to that record, for she is now doing better than she was thirty days ago, and the sixty days' record will be closed Saturday night.

It is these records that bring the attention of the whole world and the whole dairy universe to the State of Wisconsin.

A Member: Do you know how she is being fed?

The Chairman: Yes, I do know a little about it. Mr. Gillet says she is having twenty-three pounds of grain a day. Mr. Wells was there yesterday and may be able to correct me. I think she is eating in addition to that, thirty pounds of silage and thirty-five pounds of sugar beets, and hay without regard to weight, practically. As we have a little time this

morning, I think it will be valuable for us to know a little bit about how that cow is handled. She is kept carefully in the barn, watered and fed there; she is kept in a box stall and blanketed all the time. Mr. Wells said he was there yesterday afternoon when Mr. Gillett milked the cow and it was marvelous to see the pains he took to get the last drop of milk that she had. You may say, that has not any bearing upon your life as dairymen, but I say it has. We think a cow is doing pretty well that makes a pound of butter fat a day, and yet that is only one quarter of what a cow has been known to do. But let me tell you, this cow is not an accident, she is a result of a long line of breeding that Mr. Gillett and his father have been paying attention to ever since I can remember. In 1881 they bought the great-grandmother of this cow, and in 1887 they bought the grandmother on the other side and have been mingling these two strains since that time. Not only does she show her breeding, but the calf that was dropped by her this year is said to be a marvel of excellence by those who have seen it. These records are turning the eyes of the dairy universe all toward Wisconsin, and Wisconsin is destined to become, not only the leading state in dairying, but it is also going to be the leader in the production of the best dairy bred cows and I think that this Wisconsin Dairymen's Association can take to its credit the work of bringing the most advanced dairy ideas into practice in Wisconsin down through all these thirty-five years that now result in the great and general dairy prosperity of the state.

Mr. Wyatt: How is this contest conducted?

The Chairman: It is an official test. There has been a representative from the Experiment Station at Mr. Gillett's place, who has watched every detail and been in control for sixty days. There is no opportunity for graft or deception. Take this case, Mr. Gillett will probably sell that cow for $10,000 when he gets ready to sell her, and you may be sure the Experiment Station does not want to vouch for that work unless it is all right, so every care has been taken. They have changed the man in charge, Prof. Woll, or his assistant, has come up from Madison and stayed there for a while, and then the man has been changed, so that there can be no possible question about this test. The man takes a sample of the milk

as soon as it is milked and puts it under lock and key until he tests it. The man who is in charge is compelled to report every day to Madison just what she is doing, so that they may more closely keep track of the work.

More than all that, the Holstein-Friesian Association are watching it as closely, although of course we might say they are an interested party, but the Station cannot be called in any way an interested party, and there is no reason in the world to question any fact contained in this record in the least.

I might go on and talk a good while of the benefit that accrues to the dairy industry through these official tests, but you will hear more of them.

I want to speak of one more thing. It was my privilege, last week and the week before to be in attendance upon the Farmers' Course at Madison—not all the time the first week nor the last week—six hundred farmers were there in attendance upon that ten days' course of study, and a more enthusiastic, earnest lot of men I never have seen.

What impressed me more than any other one thing was that there was not what I call a "critic" in the bunch. There wasn't a man that came down there endeavoring to tell a university professor what he knew, there wasn't one single criticism at any session that I was able to attend of the work of any man. They were all there to learn, and four-fifths of these men, if not more, were men who are particularly interested in the dairy industry and a large portion of them were using pure bred dairy sires on their farms and had silos and farm separators and many other evidences that they were of the advanced class of dairymen. They were going back from that ten days' course of study inspired for better work upon their farms, not only to make more dollars, but to be better farmers in the larger sense of the word.

I asked one of the pioneer members of this Association this morning what constituted a successful farmer, and the answer was, that he should not only make money, be successful in a financial way, but also keep his farm in such condition as to soil and the stock kept and the buildings, fences, etc., that his example would make his fellow farmers better farmers for his influence in the community.

I want to call your attention to our program, and partic-

ularly to the milk and cream exhibit. I believe we will have a good exhibit of milk and cream that will be scored by gentlemen from the Dairy and Food Commissioner's office at Madison, and prizes will be awarded upon its cleanlines and purity, etc.

We have a fine program as you see, and we want you to help us to make it a success that we may be inspired to be better dairymen and in a larger sense more successful farmers.

Secy. Burchard: I want to call your attention particularly to the second paper this afternoon, "Why the Silo?" This paper will be read by Mr. Hill, who has had a silo now some twelve years, is it?

The Chairman: Nineteen.

Secy. Burchard: I doubt not there are a good many people in this vicinity who have some question as to whether it really pays to have a silo, and they will bring up all manner of objections to the silo; it costs too much to build one; it costs too much to get the corn into it, and all that sort of thing; it makes sour feed anyway. But Mr. Hill has tried it, he says for nineteen years—he doesn't look it, does he? Well he had a father before him who brought him up in the way he should go, and we will go back to cover the nineteen years. Mr. Hill will give you figures which will be of considerable importance. Upon this progrom we will find many other interesting papers.

Adjourned to 1:30 P. M.

Convention met at 1:30 P. M.

Vice President Hill in the chair.

The Chairman: I do not need to tell you that Mr. Wyatt's farm produced the milk that took the gold medal at the National Dairy Show, at Chicago. It was this show that particularly gave us the idea of having a milk show at this meeting of the Association, and very likely it helped to interest Mr. Wyatt and his neighbors to ask the Wisconsin State Dairymen's Association to meet here this year.

For several years past, at the meetings of this Association, we have had some one, prior to the convention, take a so-called "cow census," going among the farmers, the factorymen and

patrons of one particularly creamery or cheese factory or two or three factories, and finding out, first, perhaps the man's own estimate of his cows, and his idea of the cost of keeping them, etc., and then going over the figures with him and determining, as nearly as possible, what it did cost him to keep those cows and how much they have produced for him, and these have always brought out some of the most valuable discussions and knowledge that we have obtained in these meetings.

A LOCAL COW CENSUS.

E. E. Wyatt, Tomah.

I wish to present here today a few facts I have been studying, concerning the cows that were being kept to bring a revenue of some $112,000 during the year Dec. 1, 1905 to Nov. 30, 1906. I have visited 52 farmers during the past two months, to find what it has cost them to feed their cows during the year named.

None of these farmers had an exact account of what they had fed their cows, but by using judgment and studying their methods and ideas of amount fed, I would find the number of tons of coarse feed and its kind, together with grain and kinds used, amount of soiling and roots.

I realized that some fed much more than others, especially coarse feeds, as these feeds were very cheap that year, while others fed still more closely, even not allowing enough to carry the cows through in good condition. But in all, while I do not expect my estimates are exact, I think they are very close and all concurred in the opinion that they were very fair estimates and as close as possible to secure.

Now having found the amount of the several feeds used, I charged the cows in every herd the same price for the same articles and as follows: Timothy hay per ton, $7.00; mixed hay, $6.00; clover hay, $5.00; corn stover, $2.00, shredded, $3.00; corn fodder, $3.00; straw, $1. soiling crops, $2.00;

roots, $4.00; oats, 29 cents per bushel; barley 40 cents; corn 40 cents; rye, 45 cents; bran, $17.00 per ton; standard middlings, $18.00; oilmeal, $1.50 per cwt.; pasture, $5.00 per cow.

Next, I went to the books of the creamery at Tomah, as all these were patrons of the same creamery, and the entire product, except for calf feed and family use, had been sent there. I found the number of pounds of fat and cash returns for the same for each half month; computing these, I found the exact amount of fat and cash for each herd, and then reduced all to the basis of one cow or an average cow for the herd.

This, with the cost of feed per cow, I have arranged in tabular form, and will place it so it may be examined by all during the convention. It has each herd designated by number, then the number of cows in herd, and kind of cows, the cost of feed in dollars and cents per cow, cash creamery returns per cow, and number of pounds butterfat per cow. You will notice this is butterfat not butter, as this creamery does not compute butter at all, the unit being butterfat. Next, the owner's estimate of butter per cow of his herd. Take notice of the variation, but consider one is butter and the other butterfat. The average price per pound of butterfat follows, and next the cost of the same pound of butterfat. The value $1.00 worth of feed brought, and the profit or loss per cow per year. Those in red show a loss between feed and creamery returns.

Now, to a casual observer, this table might not show any more than so much wall paper. But let us study it and make some comparisons.

Take No. 1. His feed per cow was hay, a little stover and straw to amount to $12.94; grain, barley and oats, $10.16; this with pasture makes a total of $28.10. Out of this his cows produced 166.5 lbs. butterfat at 16 cents per pound which sold for 23.9 cents per pound amounting to $39.44, a return of $1.42 for every $1.00 worth of feed. This man estimated that his cows were producing 250 lbs. butter against a creamery yield of about 200 lbs.

COST OF FEED AND INCOME IN 52 HERDS BELONGING TO PATRONS OF THE CREAMERY AT TOMAH IN MONROE COUNTY FOR THE 12 MONTHS ENDING NOVEMBER 30, 1907.

Herd No.	No. of cow.	Kind of cow.	Cost of feed per cow.	Cash from creamery per cow.	Pounds of butter fat per cow.	Owner's estimate of butter per cow.	Average price of butter fat.	Average cost of butter fat.	Value of butter fat for $1 of feed	Profit (+ or loss (—) per cow.	Butter made for home.
1	15	Common Durham stock	$28 10	$39 94	166.5	250	23.9	16.7	$1 42	$11 84	No.
2	22	Grade Jersey 7, grade Durham 5	26 35	40 99	161.5	275	25.4	16.3	1 55	14 64	
3	10	Grade Durham 2, grade Holstein 1, grade Jersey 3, grade Red Poll 4	41 15	47 72	188 1	210	25.3	21.8	1 16	6 57	No.
4	9	Grade Jersey	50 47	53 69	200.8	225	26.7	25.1	1 06	3 22	No.
5	16	Common stock	22 65	29 2[illegible]	116 8	175	25.0	19.3	1 29	6 58	Yes.
6	4	Red Poll 1, grade Jersey 1, grade Durham, common 1	38 18	52 84	210.2	250	25.2	16 2	1 55	14 66	Yes.
7	15	Common Durham stock	28 50	36 85	148.0	....	24.9	19.2	1 29	8 35	Yes.
8	9	Grade Durham	36 04	39 91	149 8	225	25 9	24.0	1 10	3 87	Yes.
9	7	Grade Jersey	34 10	43 0[illegible]	170.5	225	25.2	20.0	1 2[illegible]	8 99	No.
10	6	Grade Jersey 5, grade Durham 1	29 54	40 [illegible]5	162 2	225	24.9	18.2	1 37	12 81	Yes.
11	11	Red Poll 3, grade Jersey 2, grade Guernsey 1, common 5	20 07	28 19	114.8	175	24.5	17 6	1 39	8 11	Yes.
12	11	Common stock	33 22	54 79	130.1	.. ..	26.7	25.5	1 04	1 57	No.
13	16	Grade Jersey 5, grade Durham 11	31 79	21 03	98.4	150	24.4	32.3	0 75	-7 75	
14	10	Grade Shorthorns	23 97	33 42	166.7	..	25 4	17.9	1 49	14 45	Yes.
15	14	Grade Jersey 8, Durham 6	26 89	28 72	118.3	150	24.3	22.7	1 07	1 83	No
16	10	Grade Jersey 5, grade Durham 5	23 [illegible]3	35 62	147.4	150	24.2	16.2	1 49	11 69	Yes.
17	4	Grade Durham	30 63	42 78	163.8	....	26 0	18.7	1 40	12 15	Yes.
18	7	Common stock	23 99	38 00	152.5	....	24.9	15 7	1 16	14 01	
19	7	Common stock	27 35	49 19	157 1	.. ..	25.5	17.4	1 47	12 74	Yes.
20	10	Common stock	22 31	41 77	161.3	250	25 8	13 8	1 87	19 46	No.
21	12	Grade Jerseys	24 96	60 84	240.7	310	25.3	10.4	2 43	35 88	No.
22	20	Common stock	26 76	40 23	160.3	250	25.1	16.7	1 50	13 47	No.
23	16	Grade Durham	25 87	36 54	144.5	175	25.2	17.4	1 45	10 67	Yes
24	9	Red Polls 3, grade Red Polls 6	29 91	44 25	178.9	225	24.7	15.7	1 41	14 34	Yes.
25	14	Common Durham stock	25 35	29 47	122.1	150	24 3	29.2	0 83	—5 87	No.
26	30	Grade Shorthorns 25, grade Jerseys 5	20 96	26 95	107.8	275	24.9	19.4	1 28	5 99	
27	20	Grade Holstein 14, common stock 6	23 15	39 79	157 1	....	25.3	14.7	1 76	16 64	Yes.
28	9	Grade Durham	33 05	51 53	208.9	250	24.6	15.8	1 56	18 48	No
29	18	Shorthorn 3, grade shorthorn 15	26 94	32 73	135.0	200	24.2	19.9	1 21	5 79	No.
30	10	Grade Durhams	39 60	41 51	168.0	120	24.7	23.5	1 05	1 91	Yes.
31	12	Common stock	22 71	35 91	148.9	150	24.1	15 2	1 59	13 20	No
32	15	Grade Durham 14, Angus 1	18 57	26 11	109.6	.. ....	2 .8	16.9	1 40	7 54	No.

33	10	Grade Jerseys	27 02	57 94	226.7	250	25.5	11.9	2 14	30 92	No.
34	19	Mixed stock	30 06	20 82	83.4	250	24 9	36.0	69	—9 24	Yes.
35	12	Grade Durham 8, grade Jersey 4	27 76	41 69	167.5	....	24.9	16 +	0	13 93	No.
36	10	Grade Durham 8, grade Jersey 2	26 32	33 30	134.5	175	24 0	19.6	7	6 98	No.
37	9	Common stock	16 81	26 92	112.6	150	23.9	14.9	0	10 11	No.
38	23	Grade Durham	27 54	36 95	145.4	225	25.4	19.8	34	9 41	No
39	5	Grade Durham 3, grade Jersey 2	22 22	39 19	156.2	225	25.0	14.2	76	16 97	No.
40	10	Grade Durham 7, grade Jersey 3	24 22	41 57	162.8	250	25.5	14.8	71	17 35	No.
41	19	Grade Durham 15, grade Jersey 3, grade Holstein 1	28 88	26 50	108.2	160	24.5	26.7	0 84	—2 38	Yes.
42	14	Grade Durhams	24 95	29 47	118.1	150	24.3	21.1	1 18	4 52	Yes.
43	10	Grade Jersey 8, grade Durham	19 06	38 34	152.2	300	25.0	12.4	2 01	19 28	Yes.
44	14	Grade Jersey 8, grade Guernsey 3, grade Shorthorns 3.	24 01	43 32	174.1	200	24.8	13.8	1 79	19 31	No.
45	16	Grade Holstein 11, grade Durham 5	30 00	52 56	213.8	....	24.8	14.0	1 75	22 56	No.
46	12	Common stock	23 29	45 54	187.6	....	24.2	12.4	1 95	22 25	Yes.
47	11	Grade Durhrm	28 86	48 22	189 0	225	25.4	15.2	1 67	19 36	Yes.
48	10	Grade Shorthorns	24 85	44 36	178.7	200	24.8	13.9	1 71	19 51	No.
49	11	Mixed stock	17 77	34 05	144.7	150	23.5	12.3	1 90	16 28	No.
50	15	Grade Durham	26 53	31 88	123.7	175	24 2	20.6	1 17	5 35	Yes.
51	10	Grade Jersey 4, grade Durham 4, grade Holstein 1, grade Red Poll 1	30 15	37 08	144.0	175	25.7	20.9	1 23	6 93	No.
52	16	Mixed stock	14 87	21 79	88.2	275	24.7	16.8	1 47	6 92	No.

No. 23 fed hay, stover and a little straw to the amount of $11.87; bran, oats, rye, $9.00 worth, with pasture making $25.87 which was made into 144.5 lbs. butterfat at 17.4 cents per pound. This sold for 25.2 cents per pound making $36.54, a gain of $10.67 over cost. One dollar's worth of feed brought $1.45.

Here are another two herds fed heavier. No. 8 has 9 cows, large Durhams; he fed hay, stover, roots and soiling $22.33; bran, middlings, corn and oats, $8.71, this with pasture amounts to $36.04. This, you will see, is a very heavy feed of roughage, but it seemed all around to be a very conservative estimate. This feed made 149.8 lbs. fat at 24 cents per pound sold for 25.9 cent per pound, total $39.91. One dollar's worth of feed brought $1.10 in butter, a profit of $3.87 per cow per year.

Then No. 30 has 10 cows, part Durham; fed hay, stover, roots $22.20; bran, oats, corn, barley and a little odd feed $12.40, making a total of $39.60, including the pasture. This produced 168 lbs. butterfat at a cost of 23.5 cents per pound sold at 24.7 cents, or $1.05 for $1.00 in feed. Each cow produced $1.91 worth of butter in excess of cost of feed.

Now compare those with these two who fed a better allowance of grain and less roughage. No. 44, fed 14 cows of dairy form. at a rate of hay, stover, soiling $9.85 per cow; bran, corn, oilmeal and oats $9.15, with pasturage amounts to $24.01. This produced 174 lbs. butter fat at a cost of 13.8 cents per pound which sold at 24.8 cents per pound, or $43.32 per cow, or $1 worth of feed sold for $1.79, a profit above cost of $19.31.

No. 45 has a herd of 16 dairy built cows. Hay, stover and soiling, $9.28; bran, oats, corn oilmeal, $14.46, with pasture, $30.00 was fed to each cow and they produced 213.8 lbs. butterfat at a cost of 14 cents per pound which sold for 24.8 cents per pound, or $30 worth of feed produced $52.56, a profit of $22.56 per cow. One dollar's worth of feed sold for $1.75.

We might go a little farther. Take No. 11 who fed very cheaply. Hay, stover and straw, $13.18; oats, $1.89, together with pasture a total of $20.07. But see, this only produced 114.8 lbs. fat costing 17.6 cents per pound, when delivered sold for 24.5 cents, or $28.19, a profit of $8.12.

Another who fed similarly is No. 52, only cost $14.87, get-

ting the cost of feed pretty near rock bottom. This consisted of hay, straw and stover, $4 worth, oats, barley, $5.87, plus pasture make $14.87. After being manufactured into butterfat it made the paltry sum of 88.2 lbs. per cow per year, but it only cost 16.8 cents and sold for 24.7 cents per pound, making a profit of $6.92 per cow.

Through doing as well as some others who fed at greater expense, still it is below the average of the 52 herds. Satisfied to be compared with a neighbor instead of looking to the top and raising a standard of business and getting upon a paying foundation.

How does this compare with a fat yield of 226.7 pounds butterfat per cow? But this must cost more. Yes, grossly, but per pound this cost 11.9 cents while No. 52 paid 16.8 cents per pound and the same amount of labor both ways.

Let us investigate this both ways a little farther. No. 33 kept 10 cows; fed hay, stover, $11.50 per cow; bran, corn, barley $10.52, which with pasture made $27.02 per cow; producing 226.7. pounds fat for 11.9 cents per pound and sold for 25.5 cents; a clear profit of $30.92 per cow and $1 worth of feed brought $2.14. Don't you think this man has a corner on the feed market? Sells $1 worth for $2.14.

Let me compare No. 21, after which I will tell you a little how he cornered this market when perhaps you may be able to spy the ladder and climb up but you cannot crowd him off, as there is lots of room up there.

No. 21 had 12 cows; fed hay, stover, $11.83; supplemented with bran, middlings, corn and oilmeal to $7.79; with soiling and pasture, it cost him $24.96 to feed his cow one year and was credited with 240.7 pounds fat at a cost of 10.4 cents per pound sold at 25.3 cents leaving a profit of $35.88 per cow. How is his corner on the feed market? Well, one dollar's worth of feed at the ordinary market prices sold for $2.43 on his corner. A good comfortable margin to do business upon.

Now, shall we run these men into court for creating such enormous profits, incite the public against them, summon them before a grand jury and have them indicted for manipulation of prices and suppression of competition? Or shall we make a quite investigation, lift the lid, and spy their business methods. They will need no summons or subpoenas. When I

made my inquiries they were very free and willing to talk and among other things gave me the key to their success, and this unlocks several compartments before reaching the goal.

First, they were dairymen, well caring for their cows, and studying their business and cows, and then applied their knowledge.

Second, their cows were built according to that dairy form and temperament and had been reared for dairy cows and were dairy cows and could not be any other form.

Third, they may made a business of their dairy work and were not mixing it up with everything else and then not attend to the cows.

Now, think for a moment! These men were not planning on what these cows would be worth, when old or worn out, to sell for butcher stock; neither were they raising any steers for the market to sell at 2c after costing 3c or more to produce. It was not in their business, but left that for the man who keeps a different cow, operates a different business and sells a different class of beef.

What would a $35 per year profit amount to beside No. 8 who keeps those large, beefy cows and has a $3.87 profit? Let each keep his cows for eight years, then let us figure up and see. No. 8 would have a total profit of $30.96 and a cow to sell for say, $26.00, or $56.96 as a grand total of 8 years of the cow's life.

No. 21, $287.04 profit, and we say this cow must sell for only $10.00, a smaller price than probtble, then this makes $297.04. Can you see a difference?

Now, where is the man who dares to jeer at the necessity of selling that cow so cheap and spoiling our beef markets with their calves. Let us have dairy cows for dairy work and beef cows for beef.

In making my inquiries I questioned each one as to what agricultural papers they read, with the following results: Those who studied and endeavored to follow the teachings of papers and investigations along the line of dairy work, specially, were making a profit of $20.66 per cow. The average herd produced a profit of $11.16 while the ones who did not read dairy literature received but $9.88 or a difference of $10.78 per herd for every cow, or $134.75 per average herd was made by doing a little reading.

As a summary, we have 52 herds, the smallest was 4 and largest 30 cows, in all, 655 cows, the average herd from 12 to 13 cows. The largest yield 240.07 lbs. fat; smallest, 88.2 average per cow, 153.5 lbs. Highest cost of keep per cow, $50.47; lowest, $14.87; an average of $26.49. Highest cost of a pound of fat was 36c; lowest, 10.4c.

A few averages: It would take 3 of the average cows to make an equal profit of the highest, or 4 of the non-readers to equal one like No. 21. Our creamery received 427,128 lbs. butterfat, or the product of 2,782 cows like the average would be required to produce this amount of butter, while 1780 cows of the capacity of No. 21 would do the same work, while it would require 4,842 like No. 52. Or, in other words, 2½ times as many barns, 2½ times as many milkers and 2½ times as many separators would be required to care for the latter kind of cows to produce the same amount of butter. Or, were the 2,782 cows producing an amount of butter epual to No. 21, the revenues of our creamery would be $174,000 instead of $112,000, a difference of only $62,000. Let us make a grab for it.

DISCUSSION.

Secy. Burchard: I wish you could explain how it comes that one patron received 23.1 cents and another 25.1 cents per pound of fat, when they were both patrons of the same creamery?

Mr. Wyatt: They are patrons of the same factory, but we all know that the price of butter was something like 20 cents through the summer, while it is something like 33 at present. To get that, I took the number of pounds of butter fat that each man brought to the creamery, and the number of dollars, and divided that finding the number of cents per pound that he got. This is caused to vary by one man bringing more in the summer time when butter was cheap and the other bringing more in the winter when butter was high.

The Chairman: I feel quite sure that the audience is interested and pleased with this paper. Now, it is yours for discussion. He has told you a whole lot of of things, but there are

a whole lot more things you want to know about the way these cows were cared for. You are at liberty to fire as many questions as you like at him.

Mr. Freeman: How many of these herds of cows were kept in a barn that has a system of ventilation?

Mr. Wyatt: I think I found four with a fairly good system of ventilation. One or two systems that pretended to be systems, but there were only four that you could call systems of ventilation.

Mr. Goodrich: I would like to ask Mr. Wyatt what proportion of the farmers that you interviewed knew what the cost of keeping was, or whether they were making any money or losing money. Did you find many that did know?

Mr. Wyatt: No, sir, as I said, none of them had exact accounts.

The Chairman: How many of them had an idea that turned out to be pretty accurate when you asked them for their estimation?

Mr. Wyatt: I have not figured that over, but I know from casual observation that most of them were a great way off. One of them made 88.2 pounds of butter fat, and his estimate was about 275 pounds of butter. How much did he know about that?

Mr. Goodrich: So it was the men that knew the least about their business that succeeded the poorest?

Mr. Wyatt: I must go back to No. 21, who had the largest profit, his cows at the creamery returned 240.7 pounds of fat. Now, if that was reduced to butter, at the usual rate, it would make practically 300 pounds of butter. He estimated that his herd was giving 310 pounds. There was another that had a very close record of his cows; he could tell me just how many pounds of butter his cows made per year. He had his cows tested and the milk weighed each day of the month and totals made. His average, according to his statement, was 286 pounds of butter per year. While the creamery returns were not so much, that would be accounted for from the fact that the milk and cream that the family used and for feeding a few calves was taken out of his estimate, so that his estimate was within ten or fifteen pounds of the correct estimate.

Mr. Newsome: What time were these estimates made for, between what periods?

Mr. Wyatt: They were made for the year beginning December 1, 1905, and ending November 30, 1906.

Mr. Newsome: What I wanted to know is this; in making my estimates I estimate from January 1, 1906, to January 1, 1907, including just an exact year. Did they all make that same estimate on just exactly a year?

Mr. Wyatt: It is made for exactly a year. Whether we began on the first day of January, or November, it wouldn't make any difference in the term.

Mr. Newsome: Now then, I want to know how those men that figure that it only cost them from $6 to $9 a cow for rough feed, I want to know how they figured. I don't believe it can be done.

I don't believe a cow can be fed a year for a cent less than $30 if he does justice to his cow, and it ought to be $40.

Mr. Wyatt: The one that was fed for $14.87, I haven't the notes here of the different kinds of feed, but each kind was figured at so much. Here's about eight tons of hay, two tons of stover and twelve tons of straw. There would be about a hundred bushels of barley and about a hundred and eighty bushels of oats, and that would be the total grain. The pasture was allowed at five dollars a cow. You can get straw at one dollar a ton, the hay you can't figure less than ten dollars a ton.

Mr. Newsome: When a man comes down and visits a farmer at his barn, the farmer doesn't have time to come at an accurate statement. For instance, the State Dairy Inspector came to my place and asked if I knew what I had fed. I told him by looking over my books, I could tell him to a penny, but we hadn't time to do that, so he went without ascertaining just what I had done. I presume that is the way with every farmer, they wouldn't have time to make a thorough statement.

The Chairman: How many of these farmers fed silage?

Mr. Wyatt: None of them. None of them were in a position to have silos.

Mr. Goodrich: There is something suggested to me by what Mr. Newsome has said about the difficulties of getting accurate information of the farmers. Now, I, in quite a number of instances, have taken a cow census and I was bound to get as accurate information as possible. If I went to a man and he said he was busy, as Mr. Newsome says, I went to see

his wife, and perhaps she could tell me something. If she couldn't I went to see his daughter, and she could tell me something, and I went to see the boys and I looked at the measures that they fed the grain in and stuck to the business until I did find out.

The Chairman: Did you ever have to interview the hired girl?

Mr. Goodrich: I suppose that is what you were thinking about all the time. But I could get the informaton some way. I don't suppose it was accurate every time, but I am going to tell some of the difficulties that came up.

I tell you, you just go along and say, "How many cows did you keep last year?" and half of the men won't tell you right. They will try to, but it is guesswork, and it is simply foolishness to ask the average dairyman what it costs to keep his cows. They will answer,"I don't know, I give them all they want to eat." "But I want to find out, I want to know whether you are making anything." "Why, you can't make any more out of them by figuring." Well, I simply followed it up. Once I was taknig a cow census around Fort Atkinson. I would ask a man, "How many cows did you keep last year, the average number?" "O, we calculate to keep about twenty." "Did you keep twenty?" "Yes, I guess about twenty."" "Was it just twenty that you kept? Were they the same cows you kept right through?" "Why, no." "Well, now how many cows did you have a year ago the first of December? I want to know just how many you had then." "Oh, I had twenty-five then. Some of them were dry, you know." "Well, they were eating all the time, I suppose." "Yes." "I want to know just the number of cows." "Well, I had twenty-five then, but I sold off some." "When did you sell them off, figure to see how many months?" He would have twenty-five cows, whether he was milking them or not, it is all the same. "Didn't you have some heifers that came in fresh?" "Yes." And you would finally figure it out of him that he had twenty-five, when in fact, he guessed he only had twenty, and he did it honestly enough.

Then, about feed. It is wonderful how they do miscalculate the feed and the cost of it. But you know if you stick to them you will find out. For instance, I met a man near Fort Atkinson, a man I knew well, a man that meant to be straight

and square, and was a pretty good farmer. He was going to Fort Atkinson with a load of corn and oats, to be ground. I said to him, "I was just going out to your place, Mr. Sherman. How many cows do you keep?" He told me how many cows, and I found he was a little bit off when I got out to his place, but I said, "How do you feed them, what grain?" He says, "Corn and oats." "How many pounds a day do you feed to a cow?" and he says, "Twenty." I says, "Are you sure of that, that you feed twenty pounds a day to each cow?" "Yes," he says, "I feed heavy." Well, I said to him, "How much have you got on this load?" He says, "I pay for it by the hundred and it is about so much," and he told me how much each load was. "How often do you take a load to mill?" "Oh, once in about two weeks." I says, "Is it just once in two weeks," And he says, "Come to think of it it is every other Monday right through." Then I figured it up, calculating the the number of cows he had and he had only fed ten pounds a day and he fed high then. As Mr. Newsome says, you can't just go and ask a farmer what he s feeding, or how many cows he has, because if you do you won't find it out. It is an actual fact that the average farmer knows less about his business than a man engaged in any other occupation on earth. He don't know what a pound of butter has cost him; he don't know what a bushel of barley or a bushel of wheat has cost him. Very few farmers do. How could anybody carry on any other business and not know what it costs? Don't you suppose your merchants know what their goods cost? If they didn't, they wouldn't be doing business a great while. Don't you suppose a manufacturer knows what the goods he manufactures cost? Of course he does; he has got to know, and it seems to me that farming is the best business on earth, or men could not survive and do such slack work as they do. Dairying is the best branch of farming and the farmers know the least about it. That is, the least about their cows and the expense and the profits of it. Now, this is pretty hard to say about farmers, but I have been right to the farms of a great many of them in this state and I know it is so.

The object of this cow census is to set men to thinking so that they will know something about their business.

Mr. Newsome: Don't you think, Mr. Goodrich, that it is a paying business to feed your cows liberally?

Mr. Goodrich: Of course I do.

Mr. Newsome: Don't you think it would pay to feed them in the summer as well as in the winter?

Mr. Goodrich: I don't know. Did any of these men feed grain in the summer time, Mr. Wyatt?

Mr. Wyatt: Not many.

Mr. Goodrich: I found that it paid me to feed my cows a small grain ration during the summer. I think they did better, not only kept up their flow as we went along, but the cows came into winter quarters in better condition and did not dry up so quick, and went out the next spring able to do more work; that was the idea that I had. Of course that would depend something on the cows and the feed.

The Chairman: Another question enters into that still farther. What about the benefit to the pastures?

Mr. Goodrich: Yes, of course, it doesn't take quite as much pasture and it makes the manure richer for the pasture.

Mr. Newsome: It makes better milk and more of it.

Sec'y Burchard: Have you practiced feeding your cows dry hay in the summer?

Mr. Goodrich: I have. For as much as twenty years before I went off my farm, my cows had dry hay before them every time they were put in to be milked, which was twice a day, and the pasture never was so good but what those cows would eat some of the dry hay.

The Chairman: What was the benefit of giving them dry hay?

Mr. Goodrich: Why, they wanted it and I wanted to please them. They like a variety and I think they did better for having it. Of course I couldn't figure that out, just how much better they did.

The Chairman: Wouldn't it have been better to feed them straw if you could have gotten straw for a dollar a ton? You could have kept them cheaper that way.

Mr. Goodrich: I don't know whether it would be cheaper or not. They have got to be pretty hungry to eat straw in the summer time.

Secy. Burchard: Did you ever drive a load of straw through your pasture in the summer time?

Mr. Goodrich: I don't go around with straw in my pastures. I have seen them take a mouthful of straw in the sum-

mer time, but they don't eat much of it. But anyway I know hay is better than straw and the old cow knows it, too.

Mr. Newsome: They like to be in the stable in fly time, too.

Secy. Burchard: I think this question of feeding grain or hay in the summer time is a very important question and one that is too often—I may say, almost universally—overlooked. Just what is the effect of feeding grain or feeding hay or whether there is any distinction between them is an open question. Prof. Sanborn, of New Hampshire, some years ago, tried the epxeriment and he found that one pound of hay was equivalent to one pound of grain for feeding his cows in the summer on fresh pasture. The Rev. Mr. Dietrich, the man most famous of all men in the world for making a profit per acre on a little farm not a great ways from Philadelphia, carries his cows through the summer time with soiling and silage; he has no pasture whatever. I don't know that there is anybody here, unless it be Mr. Goodrich and myself, who noticed it, but Hiram Smith, whom we all looked up to as a man of men to be patterned after in Wisconsin, used to say that the most slovenly way of feeding a cow was to let her go to pasture; that she destroyed more than she would eat, and if a man is using very much fine pasture, especially on high priced land, he is using it to great disadvantage. He could better afford to grow a crop and feed it to the cow so there should be no waste. Mr. Dietrich found it important with silage and soiling crops to feed some dry hay as well as grain through the summer for the effect that it had on the digestive tract. We all know that in fresh pastures the bowels of the cow are made very loose, and if you feed silage also, there must be something to correct that effect, and dry hay or dry grain will have that effect. I question whether it is so much a question of nourishment to the cow as a question of the dietetic effect. It certainly pays to feed something in dry forage, dry grain, dry feed of some kind when the cows are on pasture.

Mr. Goodrich: If you remember, down at the meeting of the Dairyman's Association at Watertown I had a chart showing what my cows produced each year, and one year they jumped up 50 pounds. Now, that was the year that I commenced feeding grain in the summer time and dry hay every

time they were going to be milked. The way I came to do it, I had a lot of feed, ground up corn and oats mixed with bran, that I was feeding the cows, and after I had turned them out to grass—the grass came a little sooner than I expected, and the feed was good and I had some left, and I thought I would feed it to the cows, and I noticed that the cows liked it and I noticed another thing, that the more corn meal there was in it, the better they liked it in the summer time. They didn't like the bran, I suppose because they had protein enough. They did not increase very much at the time, but I thought they would do better in the next winter and the next year, and I fed that hay and corn meal and oats, and they produced that next year 50 pounds of butter more. Now, I don't think it was all owing to that difference in the feed. I was improving my cows all the time.

I used to keep account of what each cow was doing, I weighed the milk every day and every milking for more than fifteen years, so that I knew just how much milk each cow produced and every two weeks I tested it with the Babcock test. I made a composite test of four consecutive milkings so I knew how much butterfat each cow was producing during the year and of course when I had any cows to sell, I sold those that produced the least, and the joke was, I didn't know until I did test them which were the best cows and which were the poorest cows.

Mr. Woodward: Were these fall or spring cows?

Mr. Goodrich: The cows that I fed in the summer time? I commenced with those that were fresh in the spring, or in the winter or giving a good flow of milk. When they were dry, I fed them very little grain, just a little, and those that were giving a good flow of milk I fed about half what I would in the winter time, say, four or five pounds a day.

Mr. Woodward: Would you advise feeding cows that were fresh in the fall and going out dry in the summer time?

Mr. Goodrich: They should have good pasture and if dry in the summer time I would not think it would pay to feed grain.

Mr. Woodward: I mean those that are fresh again in the fall.

Mr. Goodrich: The last part of the summer I didn't think that it paid to feed grain.

Mr. Zimmerman: Were you ever bothered with your cows bloating when they had hay?

Mr. Goodrich: No, I found dry hay was a preventive of clover bloat every time, and when they are turned out into the field of fresh clover, which is liable to make them bloat, they will rush with all their might to get some dry hay to eat to counteract the effect of the green feed.

Mr. Burdick: How did you find ensilage compared with hay or grass?

Mr. Goodrich: I haven't had much experience myself in feeding silage on grass, because they generally got it pretty nearly eaten up before spring, but I know of a good many that do feed in the summer time. One of my sons feeds silage every day in the year. They will prefer silage to fresh cut corn, I know that, it is the experience of those that have fed silage in the summer time, that when cows come up to the barn after they have been out on pasture, they will eat the silage and eat about half as much as they will in the winter time. That is about all I know about feeding silage in the summer.

Secy. Burchard: Talking about that son, what sort of pasture do his cows have early in the summer?

Mr. Goodrich: His cows have very little pasture. He is keeping as many cows as he has acres of land, and he raises alfalfa and corn and feeds them silage.

Secy. Burchard: Perhaps it is hardly a fair question, but if he had fine pasture early, May and June, do you think he would feed silage?

Mr. Goodrich: Yes, he did last summer. Last summer, when I was there there was a little while that he pastured them; he had a small pasture where he kept his young cattle and the grass grew up so big that he turned his cows in and they ate silage there.

Mr. Kelley: Did he have more than one silo?

Mr. Goodrich: He only has one silo.

Mr. Burdick: My ensilage ran out before the grass came, so I wanted to know what the results were.

Mr. Goodrich: There is a Mr. Clinton out in Waukesha county; I was out there one time and he was feeding his cows silage that he said was four years old and the pasture was very good, and they ate the silage with good relish.

Secy. Burchard: Do I understand you to say, Mr. Wyatt,

that the average yield of butter fat for all these cows in these fifty-two herds was 153.5 pounds?

Mr. Wyatt: Yes.

Secy. Burchard: I would like to have Mr. Goodrich state how that average compares with the averages of censuses that he has taken, and with the average in Jefferson county, for instance. That reduced to butter would be about 180 pounds of butter.

Mr. Goodrich: Now, I may not be able to remember just right, but I think that Gen. Burchard can help me a little. You remember, General, one time, when you wrote letters to every creamery man to give their reports, and if they gave their reports correctly, it would appear that they had averaged 240 pounds of butter per cow in Jefferson county. Gen. Burchard and myself both thought that that must be entirely wrong. So I took a census of one hundred herds right around in the vicinity of Fort Atkinson, and my recollection is that they averaged 244 pounds. That confirmed us in the belief that 240 pounds for all the dairy cows in Jefferson county could not be a great way out of the way. It was all figured in butter instead of butter fat.

Now, the census that I took in Dunn county up in the vicinity of Monomonie, I think was 220 pounds. Now, what was it in Waukesha last year?

Secy. Burchard: The average pounds of butter per cow was 202.1.

Mr. Goodrich: I thought it was about 200.

Mr. Wyatt: What do you consider the essential feature in that variation?

Mr. Goodrich: In the first place there is a great difference in the cow, and in the next place there is a great difference in the care of the cow and the feed of the cow. Cows have to be fed right and handled right before you can count on a good return. You will have to divide it into those three parts, the cow, the feed and the care.

Mr. Griggs: I would like to ask what percent of the herds included in these censuses taken in Jefferson and Dunn counties and other places had been bred up to the dairy standard and what per cent Mr. Wyatt found were just common farm grades.

Mr. Goodrich: In Jefferson county, almost all the cows

have some dairy blood in them. I didn't know of but one or two herds that were anything else; that is, they had some dairy blood in them, some whole Jersey and Holstein, a good many of them Guernseys and other breeds. In all of Jefferson county there is only one herd of thoroughbred Shorthorns and that herd the man has been breeding for dairy purposes for a great many years, but he hasn't a herd that are very big producers yet.

The Chairman: Did you notice that feature in your census?

Mr. Wyatt: Yes. I have not the figures or the general average.

The Chairman: I noticed on the chart quite a small proportion of them were dairy breeds.

Mr. Wyatt: I found a great many of them had been crossed backwards and forwards and were worse out of the way than when they started.

The Chairman: What did they have?

Mr. Wyatt: I don't know—nothing, or worse than nothing.

The Chairman: Perhaps some of you are wondering why the average was lower at this creamery than at some other creamery when you have 180 pounds of butter per cow average. The man who kept down that average certainly was not the man whose cows produced nearly 300 pounds of butter, but it is more likely to be the man who produced 88 pounds of butter fat and thought all the time that his cow was making 275 pounds.

Mr. Everett: I wonder if he is here at this convention.

The Chairman: I don't think you can get him out.

Mr. Wyatt: I have another line of thought I want to bring out. There is a very common question we find where we ask about why they don't keep dairy cows. They say, "I can get a little bit out of the steers and out of the calf, and with dairy cows I can't get anything. Is there any way we can do it so we can get something out of dairy calves?" I think there are some who would like to hear that question discussed.

The Chairman: Mr. Goodrich, what answer would Mr. Wyatt or any one else give to a neighbor who says that he wants to increase the profit of his farm a little by raising steers and that you cannot get anything out of a grade Guernsey or Jersey heifer calf?

Mr. Goodrich: His paper showed what profit there was in a good dairy cow, how much more she made than one that just perhaps paid for her feed.

Mr. Wyatt: What are they doing down in Jefferson county about this?

Mr. Goodrich: They are selling their dairy heifers, that is the stock they have sold—the male calves, unless they are thoroughbreds, are sold when they are—I don't know—from a week up. We have seen loads of them every day loaded on the cars and shipped away, because they can't afford to give good milk nor good feed to be made into meat with such stock as that. They would rather give the feed to the animal that will pay a great deal bigger price, and that is the cow that turns the feed into milk. That is what they do down there and that is what I did for a good many years. I never, for a great many years, tried to sell any meat. I would sell young calves for $2.00 or $2.50, or whatever they were a mind to give for them. The calf buyer would come along every week and took what I had. The heifer calves, from the best cows, of course, I raised. I sold all of the others, I couldn't afford to feed steers, I couldn't afford to feed worn out dairy cows. I always sold them for just what they were a mind to give, just what they would bring. I sold some for $15 apiece. I remember once that I had a cow and I figured that she had averaged me $25 a year for twelve years and that would make $300 profit that I got, and I was willing to sell her for $15 when I got through milking her. I had another cow that never paid me one cent above the feed that she cost, and I sold her after several years for $75. Which did I make the most out of? The one that I made a clear profit of $300 on, or the one that I kept on several years and she just paid for her feed and I got $75 for her in the end? Give me the little cow that made the profit, the highest priced cow. I want to get all I can for the products of my farm. I want to sell my hay and my grain and my corn and my pasture at the highest price. Everybody is crazy to get a higher price. Men all over the state are almost crazy to get a higher price and yet they are feeding cows for years when it doesn't pay as well as if they killed them. Why not study and learn to feed a cow that will pay you $2.40 for $1.00 worth of feed? That is a pretty good price to sell that feed for.

Sec'y Burchard: That was the average of your whole herd, was it?

Mr. Goodrich: Yes, $2.40 for each dollar's worth of feed, and I tell you that is a big interest. If you can double your money you will get rich pretty fast—if you don't spend it faster than you get it.

Sec'y Burchard: You have struck now the keynote, only you haven't said just the one word, and that is you should look at the cow as a market, a market to which you are going to sell your produce. A man brings in a load of oats, or a load of corn, or a load of calves, in the autumn to sell, and one man offers him twenty cents for his oats and another offers him thirty, which will he patronize? If he sold those oats for twenty cents when he can get thirty, what would you think of him? The question is, what will the cow give him for his oats this cow, that cow, this kind of a cow, that kind of a cow? Think of the cow as a market, a purchaser of your produce.

Mr. Freeman: It has been up to me several times to know, to decide, what I should do in these cases of disposing of these male calves, and I have figured this way; I figured from the standpoint of what the cow had been producing and what she would produce and whether or no it would pay me to keep that caif until it was three or four weeks old, and let it have what the cow will give and take what I could get for the calf at the end of that time. I would come out a little bit ahead as I find, if I killed the calf and fed it to the pigs, and I get as much out of the butter fat that I save during that time as I would have gotten for the calf at the full time and then I have the skim milk left for my pigs and besides that have not been bothering with that calf three or four weeks. I think, as a rule, I come out ahead by disposing of my calves early. Although this year I was advised by a friend to try another plan. He said he fattened his calves on skim milk. I was afraid I would kill them, but he said, "No, don't worry." I told my hired man, I says, "It is an experiment. We might as well have our knowledge cheap and the cows are not worth very much." So we tried that. When the calves were about three or four days old, we put them on skim milk. We found it rather a slow process, and I think it is preferable to feed the calf all new milk and then take all you can get for the little fellow.

Mr. Goodrich: On this idea of finding out what a thing costs, I wanted to find out what it costs to make veal out of a calf. At that time I had grade Shorthorns,—that is a good while ago—I could get five cents a pound for veal calves, I could sell a calf when it was a day old for a dollar. Now, the question arose, shall I make it into veal, and I wanted to know how much milk it took to make a pound of gain. There is the foundation, you want to know that, and I found it out. Of course the calf does best to help himself to the milk, suck the cow, and it was just fine fun for the boys to just step on the scales with a calf and see how much the boy and the calf weighed before the calf had its dinner, and then let him get his meal and weigh again. We did that, and I found the first week it took seven pounds of milk to make a pound of gain. Now, the milk was worth a cent a pound to me, so it cost seven cents to put on a pound that I could get five cents for. That was the first week. The second week it took eight pounds of milk to make a pound of gain, and the third week, it took nine pounds. That is the law of nature in the growth of animals, the older they are the more it takes to put on a given weight. Now, you see, if I could in two weeks get that calf up so it would sell instead of a cent a pound, for five cents a pound I would make something. If it took three weeks, I made very little. If I kept it four weeks, I was running behind. So that unless it was a very thrifty calf, one that would make a good growth, I had better let it go right off when it was young. That is the way the situation was with me at that time, and I think I would be out at the end. Why, a calf took 21 pounds of milk a day and gained three pounds. You see that was a good calf that would do that; and then, I could not keep any such calf until it was four weeks old without losing money. I had one that I knocked in the head to start with.

The Chairman: The question Mr. Wyatt asked is not quite answered yet. I know he was down to Madison last week where there as a good deal of talk about this very proposition, and I think he would like to have that question answered. The question was what you might say to your neighbors who said that they wanted to get something more than just what they would get out of the milk of the cow. They perhaps wanted to raise some young stock on the farm and what could they raise in place of the dairy steer that they had to sell for two

or three cents a pound? The fact is, the cow buyers are coming in from Mexico and Central America and Cuba and other places, and they are after grade cows, and they don't care what they cost. Now, a farmer that will continue breeding with a pure bred sire may feel confident that after a while, at least, he can dispose of his heifer calves at a very fine price. Up to the time a heifer calf is two years old, he could raise her cheaper than he could a steer that will bring less money. A heifer in Southern Wisconsin at two years old today is worth at least $40 and you would have to put into a steer that you expected to get that much money from, a good deal more than you would the heifer.

Mr. Newsome: Is there anybody here that knows a genuine good remedy for bloat in cattle?

The Chairman: Mr. Goodrich gave a good remedy and that is feeding hay on grass or silage. Or if they have access to a straw stack, it would help them. If it becomes necessary, use the trocar and save the cow's life. We haven't any more time for this subject, and I am going to ask Mr. Everett to sum up the truth that we ought to get from this census.

Mr. Everett: I was not here to hear about the census, but I want to say that $2.40 return per cow for one dollar's worth of feed is pretty profitable farming, and the farmers should not lose sight of the fact that the cow has paid the market price. She returns the dollar spent for the feed and she returns $1.40 besides, so that, for instance, if oats are worth thirty cents in the market fed to that kind of cow, she will bring back about seventy cents a bushel for the oats.

The Chairman: And that is not all; she has left the fertility on the farm which you would have sold off at so much a bushel if you had sold your oats. Mr. Everett says he did not hear the census paper. General Burchard did. We will let him sum up.

Sec'y Burchard: I don't think it is necessary to say anything in addition to what has been said here, except to suggest that if there is this difference between herds, there is very likely to be a similar difference among the several cows in the same herd, and that, Providence permitting, the closing subject on this program alludes to that very thing, namely, "Robber Cows, a Detective's Report." This Association has had two inspectors in the field, one devoting all his time since about the mid-

dle of May, the other only a portion of the time since July or August, in trying to find out and show to dairymen just which of their cows belong in this class that yields $2.40 for this dollar's worth of feed and which ones pay less and which ones do not pay for their feed at all. Now, the important thing is not to know what the average of the herd is, but to know what each individual cow can do, and I feel like saying that I think Mr. Wyatt has done himself proud in taking this census and in reporting it. If he wasn't here, I would say that I felt just a little bit nervous about trusting this important work to such young hands, but I am satisfied that I made no mistake in asking him to take this census.

Mr. Wyatt: I would like to say just another word.

Remember, this was taken on a very cheap feed. Running over them again, taking this one herd, No. 21, making a rough estimate on the figures as to the feed and the prices, for instance mixed hay is put in at six dollars. Put it in at $12 which it should be this year, and then find out how his profit stands. I find that the difference in the price of feed would reduce that about $8 and still leave him a profit of over $27 a cow and so on down through.

Mr. Everett called to the chair.

The Chairman: I want to comment on what friend Burchard said in just these words, the individuality of the cows of the herd. Now, I know that as dairymen we are very likely to consider the herd as a herd and not as individuals, and there is where we make a serious mistake, not doing business with each cow in the herd, but with the herd as a whole.

As editor of an agricultural paper, The Wisconsin Agriculturist, I receive a great many letters, they come faster and faster every week, asking for information in regard to building and filing the silo. I really am astonished at the awakening of the people on the question of this silo business in this state. Our farmers have come to understand that it is really a necessity in profitable dairying. The other day I received a letter from a farmer over in Crawford county, who wanted to know how to build a silo and he wound up by asking me if he would need to wear rubber boots when he took his silage out of the silo, but let the farmers know a little more about silage and they will know better than that. Mr. Hill is a veteran on this suject and he will now tell you practically all that there is in it.

WHY THE SILO.

Charles L. Hill, Rosendale.

This ought to be one of the most important subjects to be discussed at this convention. I have been much interested in the way Mr. Wyatt's report has been discussed, and all I ask of you is to listen to my paper and discuss the question, not from a critical standpoint, but as learners.

The aim of every manufacturer is to produce each year a little better grade of goods than he did the year before, and at the same time produce them at a lower cost.

As dairymen we are manufacturers, striving each year to increase our production of milk, and its products, and also to cheapen their cost.

For this reason first of all we need the silo, for in no other way can we so economically produce the rough feed for our cows.

I find that on my own farm I can cut an acre of corn yielding 13 to 14 tons and put it in the silo for $7.00, or about 50c per ton.

The same acre of corn would have 150 bushels of ears that would cost me $6.00 for husking alone, which with the cost of cutting, shocking, shredding and grinding, costs me double what it does to put the same crop into the silo.

It is usually estimated that it costs 70c to $1.00 per ton to put corn in the silo, but I know that myself and neighbors put it in for $.50 to $.60 per ton.

My silos this year were filled very full holding 22 acres, and close to, or quite, 300 tons, and the total expense, figuring men at $1.75 per day would be $150, exclusive of the board for the men.

In what other way can you handle a crop of corn so cheaply and have it ready to feed, not only prepared for feeding, but right where you want it.

Not only is silage the most economical of rough feeds, which I think is the greatest claim that can be made in its favor, but it is also greatly relished by almost all kinds of stock, and is absolutely necessary for the production of maximum yields of milk in the winter time.

It is an easy matter to tell by the condition of a cow's coat in the winter time whether she is getting silage, for its succulence has the same effect on a cow's system that pasture grass has, and it keeps her thrifty and in the best of condition for her everyday work.

How would you like it if your good wife compelled you to live on only dried foods in the winter time?

You could not have the potatoes, apples, cabbage, celery, and hosts of other things that you relish, but would have to live on bread or other flour products, dried vegetables and fruits, and even these latter the housewife would soak up endeavoring to make them seem more like the fresh.

If any of you have been denied the privilege of standing before a long string of cows when the semi-daily feed of silage appears, and watch the eagerness with which they await it, you have indeed been denied one of the delights of dairyman's life.

They will leave everything else ecxept the best of alfalfa hay to eat silage.

Silage is also more digestible and nutritious than the same amount of food value the chemist would say was in dry feed.

Another point in its favor is its convenience.

With silage ready for feeding every day in the year, much less help is required to care for the herd, than will be needed where it is necessary to cut or shred fodder in the winter time when it is cold, and possibly snowing.

Ten to twenty minutes per day will be all the time required to get out the silage and feed the herd.

Nearly all the talk about silage for feeding is concerning its use for winter feeding, but I insist it is almost as necessary in the summer as in the winter.

If we could be sure we would have plenty of rain, and resulting good pasture all summer, silage would not be so necessary, but almost every summer brings us a dry period when the pasture gets poor, and the cows shrink so in their milk unless we feed them that it is impossible even if later we do have good pastures, to get the cows back to their normal milk flow.

If you have no silo this want can be supplied by the use of soiling crops, but it takes considerable time in the busy season, each day, to hitch onto a wagon drive to the field, hitch onto the mower, rake, and wagon again and draw in the green feed.

Feed handled as silage is handled much more cheaply.

Nearly all of the best dairymen like to feed some feed to their cows even when on the best of pasture, not only for its food value to the cows, but also for its manurial value to the pastures, and nothing is more convenient for this purpose than silage.

Probably I have said enough about the need of a silo and will add a few suggestions for those who contemplate building one.

The smaller the farm in proportion to the number of cows kept the more necessary the silo becomes, and any farmer with ten cows who wishes to reach the maximum production from his cows should have a silo.

I have in mind a farmer in Sheboygan Co., who kept ten cows and had a small silo in the corner of his barn, filled by himself and daughter with whole corn, that furnished perfect silage and made his cows pay for his farm.

I know of another farmer near me with 40 acres of land who with a silo made his ten or twelve cows earn him $72.50 each the past year at the creamery, and he does all his own work except at silo filling time.

In planning to build remember the best is really the cheapest, and if you build a silo that will last you a lifetime, you need to figure its cost to you as only 6% on the amount invested as it will be worth as much at the end as when you built it.

If you built a silo for $500 its real cost to you would be but $30.00 per year and if you will think of it this way, can you afford to be without one?

If you cannot possibly build the best, build the best you can but build anyway.

Build it deep and of small diameter, as this will insure you better silage especially in warm weather.

No matter how large the herd up to 100 cows I would not build over 18 feet in diameter, and 14 or 16 is better for smaller herds.

The best silos are certainly the round ones built of brick or cement with dead air spaces. This provision would not be so necessary in a winter like this but sometimes in severe weather solid wall silos will allow the silage to freeze, which while injures it but little it bothers about feeding, and frozen silage is not good feed.

Stone or wood silos, brick lined will also make splendid silos, and the only ones really expensive are the wooden ones.

However I used two rectangular wood silos for 18 years, and in the days when those were built and good common lumber only $12 per M even these were cheap silos. Many built of wood at the same time have been gone for years.

When silos were first built of wood some of them did not cost over $1.00 per ton capacity, but the best ones as built today will cost $2.00 to $3.50 per ton capacity but will be good when the cheaper ones are gone.

In building your silo locate it as conveniently as possible to your stable, as the difference of a few feet in distance will in the year's feeding make a difference of many miles of travel.

The popularity of the silo is ever on the increase, and its users are its warmest friends.

The men who condemn the silo, are the men who have not used it.

Of the 600 farmers who attended the Farmers' Course at Madison last week 113 reported they were feeding silage, and about half of the remainder said they would build silos this year.

Wisconsin is destined to be the leading dairy state of the Union and one of the things that will contribute largely to this end will be the increasing use of the silo.

I often think that after feeding silage 19 years I would want to quit dairying if I could not have the silo.

I hope and believe that many of you have silos who live in this vicinity, but I also hope that the discussion of this paper will cause many of you to determine to have a silo before another corn crop is ripe.

Again, build just as good a silo as you can, but build one anyway.

DISCUSSION.

Mr. Freeman: What size silo would you recommend for ten or twelve cows?

Mr. Hill: We all swear by Hoard's Dairyman; if you will look on page 60, you will find figures of the cost of building a

cement silo. I was at this man's place when he was getting ready to build; he lives some five or six miles from where I do and he keeps a small herd of cows, I don't think over eight or ten. He has built a silo 31 feet deep and 10 feet in diameter and I think for that sized herd, it would be an ideal size.

They can be built much smaller of cement than of stone or wood.

Mr. Newsome: How deep below the ground would you go?

Mr. Hill: Just as far as possible and not get over six or seven feet below the feeding floor of the stable. I know one place where a man has a silo where he can practically pour the silage into it. If you are not situated so you can put the silo on the upper side of the barn, then go six feet into the ground. Of course there are some places where you can not go six feet into the ground on account of the water, but where the water doesn't bother you, the only objection to going deep into the ground is the trouble of getting it out, and it is easier to get it out of five feet below the ground than up higher.

Sec'y Burchard: That is not the only objection to going further into the ground. I wouldn't like to have the death of a child or a grown person charged up against this Dairymen's Association. It is not very probable, but it is quite possible, if the lower opening of the silo is much below a man's chin, that sometimes he may be overcome by carbonic acid gas in the same way that the same gas gathers in deep wells, so that it is not safe, in my judgment, to make them too deep. Many silos are built that way and no accidents have happened, but it is not safe really to have a silo more than six feet below the lowest opening out of the silo.

Mr. Hill: There is one silo in this state, at the Marathon County Asylum, where four deaths resulted from carbonic acid gas. That did not come from going deep below the ground but from the fact that they put the doors all in and climbed in from the top. When the silo is empty, the gas would not be there. It is not worth discussing, because you wouldn't care to go more than six feet below on account of the trouble in getting the silage out.

Mr. Freeman: If you could get good stone within half a mile from where you were building, would you build with stone, or would you get cement?

Mr. Hill: I would certainly build it of stone. An ideal

silo would be to face it inside with brick and have a three or four-inch dead air space, building a foundation on which to set this brick. But the fact remains, that very many all stone silos, without any dead air space, are used in Wisconsin and those who have them like them. If you build a solid stone silo, ten or twelve feet in diameter, it is pretty sure to freeze.

A Member: It is necessary to have a dead air space below the ground?

Mr. Hill: No, it won't bother you, freezing down there.

A Member: How about ventilation on top?

Mr. Hill: There ought to be some ventilation at the top. If you have a circular silo and you put on a cupola in the middle, that is all right, but there should be arrangement for ventilation on top for the preservation of the roof.

The Chairman: How about stave silos?

Mr. Hill: I think that in the East the silos put up are largely stave silos. They don't have there the objection as to freezing that we have in Wisconsin. Of course a stave silo will allow the silage to freeze, though not as badly as in a stone silo. In case of a small silo, it would freeze more than you can afford to have it. They cost two or three times as much, (that is, the best of them,) as the best silo built of cement or stone, and they are not as durable as a silo of brick or cement or stone. A farmer must be very careful in taking care of them. I have seen them where they have gone to ruin. I was at a farm last year in New York State where they had put up a silo, a new one. The contractor had put it up and gone away and fastened it temporarily to the corner of a building and another contractor supposed it was fastened and somehow it was cut loose and over it went and it was nothing but a mass of kindling wood. I think we can build better silos than stave silos in Wisconsin, although they are very much better than a wooden silo built any other way, and ever so much better than no silo at all.

Mr. Lee: In that stave silo, were there any tongues and grooves?

Mr. Hill: Yes, not very deep. It was one of the best silos built in the east.

Mr. Goodrich: If you tighten up the lugs in the spring and the next year they will swell and shrink again, what will

happen to your silo in the course of years? I know what happened to one, two or three or four miles from Fort Atkinson. They had to build another wall under it to keep it from dropping down.

Mr. Hill: I have not had experience with stave silos. I have visited a number of farms in the East where they used from one to eight or ten stave silos and they speak very highly of them. They are, most of them, set on a cement foundation.

The Chairman: General Burchard has a stave silo that I think is in good shape yet.

Secy. Burchard: Yes. Pine makes good silos and hemlock makes good silos. The stave silo is a good silo.

The Chairman: They are making a number of stave silos that are good; some are made of cypress and some of pine. Every farmer who wants to build a silo cannot afford to put up a stone or cement silo.

Mr. Wyatt: Would you recommend the King system silo?

Mr. Hill: That was a wooden round silo. I don't believe that at present prices of lumber, except in the case of the stave silo, that it would pay to build a wooden silo. Lumber is getting higher and poorer every year. The King silo is all right, but it is not durable enough with the present prices of lumber.

A Member: How thick should the wall of the stone silo be?

Mr. Hill: They should be build 18 inches thick. Some are thicker at the bottom, two feet. Some are using cement blocks, but I think the better way is to build your frames and build of cement.

Secy. Burchard: Tell us somthing about roofs on silo.

Mr. Hill: I know less about roofs on silos than anything about them. I have a number of silos and I roofed them with long V-shaped roofing, because it happened to be the most convenient.

Mr. Goodrich: All the silo needs a roof for is to keep the snow out; the rain won't hurt the contents.

The Secretary: Four or five years ago I built a silo, the mechanics were all busy and I had trouble to get it finished in time enough. I was in a hurry to put the corn in and I finally got men who promised to go out and help me put on the

roof, a certain man promised to come and do it in a short time, finish it up. So I put the corn in. He didn't come, and that was a very wet fall, it rained and rained, and it was'nt very long before some of my neighbors began to talk to me about it. They said that silo didn't speak very well for its owner and the silage would all be spoiled, of course. I said I knew it, but I did the best I could under the circumstances. Then finally, a long time after Thankegiving, the man came and we put the roof on and very soon after that we commenced to feed the silage to our dairy cows, and I was surprised to find there was but very little waste, three or four inches of mouldy silage on top, which was thrown off of course. The water did it good. Mr. Gurler, down at DeKalb, Ills., has some silos out in his field and no roofs on them at all, and as Mr. Goodrich has said, so far as experience has gone, you don't need any roof on a silo, except for the purpose of excluding the snow in the winter so you can get at the silage to feed it. You may put on some loose boards and keep the snow out, or cover it with straw to keep the snow out, and you will have first class silage. It won't be so nice looking as if you have a fine looking building and a cupola on top, but it will keep the silage all right.

Mr. Goodrich: I went down into the State of Indiana to take a cow census, and of course I traveled around amongst the dairymen. A good many of them had stave silos from 14 to 16 feet in diameter that had absolutely no roofs on them, only they had a cover that was just flat and a place where you could roll it off out the way and when it came winter and the snow began to fall, they could slide that cover on to keep out the snow, and they all claimed that the silage kept all the better for the rain coming onto it.

Secy. Burchard: If a man doesn't feel able to go to the expense of putting a roof on, he needn't do it this year or next year, or until he gets ready to do it.

Mr. Sweden: In constructing a silo with a brick lining, do you advise building it with stone or some lighter material?

Mr. Hill: I would recommend some light material. My neighbor, Mr. Scribner, has one lined with brick and wood on the outside with a dead air space. I think if I was going to do this that I would go to the further expense of covering it with galvanized iron. Wood sprung around a silo, especially

if it is a round silo, has an inclination to split off a piece around the side. I have not seen a silo fixed that way, but I have heard two or three who say they are going to cover the outside of their silos to preserve the wood. If you are going to cover with iron, you can put on much cheaper lumber. All the lumber is for is to act as a hoop to support the brick. You set up the perpendicular studding and sheath it around outside. If you have a stave, you can use a good deal poorer stave if you are going to cover it on the outside with something else.

Mr. Freeman: Is there any one who can give us an approximate estimate of what the cost of this brick lining would be?

The Chairman: What is the price of brick with you?

Mr. Freeman: Eleven dollars.

The Chairman: You ought to be able to buy brick cheaper than that, around $8.50, and in Southern Wisconsin for $7, or even less than that.

Secy. Burchard: If you want to be economical, you can set the brick up on edge and they are just exactly as good. You don't have to lay your brick down flat, they are just as good set on edge. Of course you will have to have a heading course every little way. If you are going to have a two-inch dead air space, your brick will go to the side against your lining. If you want a four-inch dead air space, the brick may go on in this style, or you put it this way, and that will make a six-inch dead air space. A two-inch air space is just as good as anything.

A Member: How thick will the inside cement wall need to be to stand?

Mr. Hill: They re-enforce that inside wall with wire which is laid in the cement. When you contemplate building a silo, by all means send to the Wisconsin Experiment Station and get the Bulletin on Silos. It is a book in itself that will tell you practically all you wish to know about building silos. It does not deal quite so fully with cement silos as the others, because in the last two or three years cement silos are being built more and more.

Mr. Sweden: If a solid cement wall is built, is it not more apt to freeze?

Mr. Hill: If I were building at all with cement, I would build with a dead air space and with frames.

Secy. Burchard: In this brick lining, it is a little better to set the brick on end than sideways, it turns the circle a little better, although if a silo is going to be as big as 14 to 16 feet, it won't make any difference. The inside of the brick work is cemented anyway, so it is made perfectly smooth.

A Member: Are bricks cheaper than cement at $8.50 a thousand?

The Chairman: I don't think so; I think the cement would be the cheaper. Cement does not vary much over the State, but the nearness to gravel or broken stone, all those things can be figured out when you get at it.

A Member: If you have good, coarse sand, do you have to have gravel?

Mr. Hill: It will be cheaper to get some coarse material rather than to use the extra cement necessary. It will be necesary to have one to three of sand to make it strong enough, and you can add three or four or even more parts crushed stone to that and make it really better than it is without.

A Member: Do you know how much your brick silos cost you?

Mr. Hill: Yes, I do know what they cost, but I hate to say for fear I might discourage someone, though I feel that they were cheap silos for me to build. In the first place, they were a patented silo and something was asked for the patent. They are 15-10 inside and 35 feet deep, and they cost between $550 and $600 apiece, exclusive of the excavation. They are the very best I could build, and I believe they are cheaper than anything else I could build in my neighborhood. The first silo we built was 14 by 21 feet and 22 feet deep and the material cost about $74 on the cars, so that the whole cost of the silo was only a little over $100, and that silo was used eighteen years, but the same lumber would cost three times that now and be poorer in quality than that was.

I wanted to say something when the question of summer feeding with silage was up. I feel that it is almost as important to have silage for summer feeding as it is for winter feeding. I know I sleep a whole lot better nights now from knowing that I can't possibly feed out the silage in my silos if I feed 360 days, and I tell you it is a pleasant feeling when we have a dry year. I have a number of years fed silage every day in the year and have had silage to spread out on the

bottom to start to fill in again, but I am sorry to say a number of years I have been left without any.

A Member: How many acres did you cut last year to fill your silos?

Mr. Hill: Twenty-two acres and it was a little better than an average yield. We talk about getting twenty tons to the acre, but when some expert comes around and wants your corn, your yield isn't as big as you thought it was. It is like the man's cows that yielded 88 pounds when he thought they were yielding 275.

A Member: How much stock will that amount feed?

Mr. Hill: The roughage ration is thirty pounds a day. If you feed a cow 300 days, it will take five tons for her, and three hundred tons will feed sixty cows the major part of their roughage ration.

Mr. Newsome: Do you feed any ground feed with it?

Mr. Hill: Yes, I feed the cows according to the amount of milk they are giving at the time, varying from four to eight pounds a day. I think some cows have had some years eleven or eleven and a half, but that is the maximum. There is considerable corn in the silage.

Mr. Newsome: What is your ration?

Mr. Hill: The usual ration is bran and gluten feed in about the proportion of 4 to 1 or 3 to 1. I think if you have clover hay or alfalfa hay, you can substitute something for the bran. Bran at $20 a ton is pretty expensive feed; if you had clover hay you could substitute ground barley or corn.

The Chairman: What would a cow do on ensilage and alfalfa without any grain?

Mr. Hill: If you had good silage and alfalfa hay, it would cost less than what it cost that man to feed his cows that got the 88 pounds and you would have a good deal more than 88 pounds of butter.

Mr. Newsome: Have you ever experienced taking the grain away from your cows and feeding more ensilage?

Mr. Hill: No, I have not.

Mr. Searles: What does that silage cost you per ton to raise and put in?

Mr. Hill: I have kept accurate account of what it cost me some years. Of course the yield of the corn and the price of

labor would enter into that, but I am sure that year after year I can grow corn and put it in the silo for a dollar a ton.

Mr. Newsome: That is the labor?

Mr. Hill: No, that will cover everything, the rent of the land and everything. Perhaps I would have to revise that by saying I could not do it with the present prices of labor, but the years I did keep track of it it would run a little less than a dollar a ton. It may cost now $1.10 or $1.15 a ton, but certainly not over that, when I could put it in for fifty cents, as I know I can.

Mr. Goodrich: When I took my census in your neighborhood, I figured silage $2.50 a ton, and the way I got at it was by figuring what an acre of corn was worth and the number of tons it would make, and I think that is the proper way to figure the value of silage, and of the material that is put into it.

Mr. Hill: I disagree with you for this reason—partially disagree—because I have put in a crop of corn that was 150 baskets, say 75 bushels of shelled corn per acre for 40 cents a bushel and 30 cents. But the fact is it costs me eight, yes, ten cents for husking, in an average year it cost me ten cents out of that forty cents a bushel to husk it alone.

Mr. Goodrich: It is all right to figure it that way. The way I figured it was that an acre of corn was worth, that is, by selling it, husked and all, you would get 25 cents, then sell the fodder, and it would make ten cents difference. That made the silage worth $2.50 a pound.

Secy. Burchard: You are talking from two different standpoints. What did it cost to raise that acre of corn that you talk about? Mr. Hill is showing not what he could sell an acre of corn for, but what it cost to raise it.

Mr. Hill: If I have a couple of friends who are looking for feed and I am going to sell it to them, then I call it worth $2.00 or $2.50 a ton.

Mr. Goodrich: When I was up there, there was a question I propounded to several intelligent men, including Mr. Hill and his father, what should I charge for silage fed to cows and some put it down to a dollar and some up to four or five dollars They said: "Timothy is worth $12 a ton and silage is worth one third as much, it has one third as much dry matter in it and that makes the silage worth four dollars a ton. I don't

figure it that way, I figured to take an acre of corn as it was grown and stood there. Now, then what is it worth to harvest it and to sell the forage?

Mr. Hill: I charge my cows with it at $2.00 a ton and when anybody asks me what it costs to keep a cow—I am just hog enough to make two hundred per cent on it. If I am going to get 80 cents a bushel for wheat I wouldn't like to raise it for a dollar. I charge my cows with silage at $2.00 a ton.

Mr. Goodrich: We have been talking about selling things in the market. Now, then, you could sell that corn and sell that fodder and get 25 cents out of it. Now, will you sell it to your cows and only charge them a dollar a ton?

Mr. Hill: I beg your pardon, I could not sell it for 25 cents. I couldn't afford to, because it would cost me so much more to get it ready to sell.

Secy. Burchard: What do you estimate the relative feeding value between silage and good timothy hay? Two and a half tons of silage has the same amount of nutriment in it that a ton of timothy hay has.

Mr. Hill: I should have said 1 to 3.

Secy. Burchard: That is what Mr. Goodrich says, but I think it is only two and a half.

Mr. Hill: I would rather have two and a half tons of silage to feed my cows.

Secy. Burchard: But then silage at $2.00 a ton is cheaper than timothy at the usual prices.

Mr. Hill: Yes, it certainly is. If you could buy silage for $2.50 a ton, you couldn't afford to pay over $6.00 a ton for timothy hay to feed cows.

Mr. Newsome: How do you harvest your corn?

Mr. Hill: We harvest it with a binder, and I might say that I am fixed so as to know pretty near what is costs, because I hire all the work done. I say, when I can hire somebody to come with a horse and cut my corn I can't afford to do the work myself, I have too much other work. I grow just as much corn as I can possibly grow to the acre and have it mature. If I can have the cured corn I want the heaviest yield I can get per acre. I use Dent corn and it is heavily eared. We want to grow for silage the biggest corn that will mature with us.

A Member: How do you plant it?

Mr. Hill: In checks, three feet each way or three feet three inches each way. We don't drill it.

Mr. Newsome: Don't you think it would be preferable to drill it?

Mr. Hill: For some reasons I do, but I confess I am unable to keep corn as clean as I am bound to have it and raise drilled corn. I can be sure of keeping it clean in the hills. I know it doesn't cut quite so nice for the binder and theoretically, you say you ought to grow more corn to the acre growing it in drills, but, experimentally, there isn't as much difference as you would think there is.

A Member: Do you let your corn get ripe?

Mr. Hill: Yes, it is practically in condition to cut for the grain, perhaps not quite ripe. When the lower leaves first begin to turn yellow or the husks are turning yellow then it is rushed into the silo. Three of us have a large self-feeding cutter and run it with an engine and we fill the 150-ton silo in about two days, rush it in as fast as we can.

The Chairman: The sooner the better.

Mr. Hill: There is no danger of filling it too fast, only if you fill it more slowly you can get in more. You can fix that all right if you wait a few days between. I don't care whether it is wet or not, except when it is so wet that you cannot ask the men to handle it. I would like to know how many men there are in this audience who have silos. Twelve, including myself.

A Member: Do you use a blower?

Mr. Hill: No, we use a carrier. I bought a big carrier before the days of blowers and it is all right yet.

A Member: Do you use steam or gasoline?

Mr. Hill: Steam. I hire a steam engine for $4.00 or $4.25 a day and a man to run it. They will run a gasoline engine for $6 a day and furnish their own fuel.

A Member: What did your carrier cost?

Mr. Hill: I don't know that I can answer that. I think it cost $250. Three of us own it in company and we have it mounted on a low platform wagon on trucks. I think you can buy them cheaper than that now.

A Member: Did you ever see any ensilage put in with a corn cutter?

Mr. Hill: No, I haven't seen any, though I know some do put it in that way and like it very much.

A Member: I saw some this winter that Warren & Company put in with a cutter and it was fine. Have you seen any put in whole?

Mr. Hill: Yes, I have seen it put in whole. it will be sweeter a good deal. There is a sample of silage here. I should say it was nice, but a little bit too much acid. Whole silage will be a good deal darker color and very much sweeter It is more trouble to get it in and to take it out. People who have not tried it will contradict that, but those who have tried it will want to cut it.

Mr. Freeman: There is 40 per cent waste when you take it out and feed it.

Mr. Hill: You mean the cattle would not eat it up clean?

Mr. Freeman. I saw one silo in Waukesha county, the man was a strong advocate of whole silage, and I was in his barnyard in the spring of the year and saw stalks piled up there, and I asked him if he had fed any dry stalks. He said no, that was what came from the silo. They had wasted as much as they would have wasted if the corn had been husked and they had fed the husks dry.

Mr. Hill: I think that criticism would be true if it was large corn.

Adjourned to 7:30.

Convention met at 7:30 same day.

Music by the Indian School Orchestra.

Exercises in charge of Rev. Mr. Atkinson.

Prayer by Rev. Smith.

Mr. Atkinson: I am sure I voice the sentiments of the citizens of this city when I say that you are welcome in our midst and we rejoice exceedingly that there is the interest that is exhibited in this convention. During the twenty years I have been in Wisconsin, I have observed those who are interested in such assemblies, and I know that they mean education and helpfulness and the largest good of the dairy interests and the farming interests of this community and this state; that these conventions constitute some of the most helpful things

that have been in operation in our state, and I trust that the result of this convention will be more intelligence, a higher appreciation and realization of the possibilities within our reach.

Music by the High School Glee Club.

THE RELATION OF SCHOOLS TO AGRICULTURE.

W. McNeel, Principal High School, Tomah, Wis.

Outside of religion there is no theme of more universal interest than education. It has a bearing more or less direct upon every activity of life. But the purpose underlying educative effort has gradually undergone a change. Up to the present time the thought was to train the mind and that alone. But the influences of this industrial age have crept in to alter, not only the purpose, but more particularly the methods. Very seldom do we now hear the expression of that antique idea,—"My boy needs no education, he is going to be a farmer or carpenter as I am, and education is not necessary for that." Perhaps many of you have seen the day when conditions gave to that expression a great deal of truth, but these conditions have undergone a radical change. The farm is no longer fenced in by a couple of dogs; everything is no longer left to the blessed trinity of chance, accident and mistake;the boy acquainted with the three "R's" reading, 'riting and 'rithmetic, no longer thinks he has more education than ought to be wasted in raising potatoes, corn and cattle; the world no longer asks the single question, "What does he know", but the double question, "What does he know and how can he apply that knowledge?" In other words, time has so altered conditions that education is essential to every holder of most any occupation. Not the edcation that makes of your brain a junk house, but the reservoir of thoughts which may be applied to the molding or construction of something that stands for something.

The principal producer to-day is the farmer. We can safely say that he is directly responsible for this great and complex industrial fabric that exists today, for without the hogs to ship, the corn to grind and the cattle to slaughter, where would lie the incentive to better the facilities along the lines of transportation and distribution? Manifestly this great development would not be possible without a corresponding development of that upon which it depends, namely, agriculture; and agriculture has enjoyed this corresponding development, through improvements resulting in more intense cultivation and by the opening up of new land resulting in an extension of agriculture.

But statistics show that the individual farmer does not receive and never has received as large a return on his investment as does the manufacturer and transporter. To a very large extent his profits are kept low by monopolies among the interests that handle his product, but the trouble lies more with the farmer than with the distributor of his product. He is not so well trained in the principles of his art as is his dependent, the transporter and manufacturer, and, consequently, is not living up to his possibilities. The typical farmer of today is not as good a business man and manager as is his neighbor who conducts a store or shop with an equal capital. He has not awakened to the needs of an education for himself and children as fully as has his city neighbor. Realization of this fact has brought about a great movement on the part of the government, both State and National, through rural school education, through research work and experimentation and by the circulation of literature which treats of the problems with which the farmer must contend.

Wisconsin was the first state in the Union to encourage the establishment of schools for the teaching of agriculture to the rural classes. The Legislature of seven years ago realized the need of the country boy and girl and appropriated $5,000 annually to provide one half the support of two public schools whose purpose shuld be to train young men and women for life on the farm.

The work carried on at these schools is intensely practical and the students "learn to do by doing." The first to be established is at Menomonie, Wis., and that city has become widely known for its industrial work done in its public schools

The other is situated at Wausau, but is not as largely attended and not so widely known.

But the state government did not stop here, however, but passed an act which has had a greater effect toward the uplift of agriculture in our state. The Legislature of 1905 provided that the curriculum of all common schools throughout the state should be so extended as to include the elements of agriculture as a required study.

In the graded school below the High school the study must be pursued for at least one half year, and graduates from District schools receive their diplomas only after they have completed a satisfactory course in agriculture. The purpose of requiring this course is not that farming be taught from the book, but it is hoped that a study of the reasons and principles underlying agriculture will serve to create an interest in farm life and prevent a dislike for agricultural pursuits. Its aim is threefold:

1. To instruct the pupil in some of the fundamental principles of agriculture;
2 To create an interest in farm life and farm work.
3. To enable the pupil to read agricultural literature with greater intelligence.

Instruction in what is commonly designated nature study is taught in the grades. This is a course of agriculture in its simplest form. In the high school we have no course in agriculture in the truest sense of the word. You know if there is a man who must be a Jack-of-all-trades and yet a master of one it is the farmer. He must have plant knowledge or botany; animal knowledge or zoology; soil knowledge or geology; knowledge of mechanics or the application of the laws of physics; arithmetic or computation by means of numbers; economics or his relation to society and a knowledge of the laws of supply and demand. All these we give to our students in the high school not under the name of agriculture, but under the name designated and they cannot help but make of the boy a better farmer; if not in the application of the knowledge derived from the study, it will by adding more interest and zest to his life.

And after all, the purpose of an elementary education is not to educate a person into a profession or occupation, but it is to prepare him for good citizenship by instructing him in

the general principles of the things that immediately surround him, and teaching him how to apply those principles. This will make of him a more useful citizen. It is to endow him with the principles of right living by impressing him that gold and silver are not the most precious things that exist, but that the sweat of the brow, good deeds and good thoughts are far more precious and are not subject to depreciation.

You have undoubtedly heard the story of the two frogs. I use it so often to illustrate various points that my pupils can tell it as well as I can. It is an old and worm-eaten chestnut, but very appropriate for a dairymen's convention.

A dairyman was going to town to distribute his milk among his patrons and on his way he stopped at a spring to water his horses and, incidentally, to water his milk cans. While he was dipping the water from the spring into the cans two frogs by chance got into the bucket and shared the same fate as the water, and the dairyman closed the can and started toward town. Now, the two frogs immediately started investigations as to how they were going to make their escape. One frog more anxious than the other made many excursions around the inside of the can and made many trips up the slippery sides only to fall back discouraged. It went to the other frog and said, "There is no use in trying to get out of here. I have investigated every square inch of the surface and can find no means of escape. We may as well give up first as last, for we are doomed to die in this place of confinement anyway." That frog sank to the bottom and became a dead frog. But the other frog took a brighter view of the situation and it kicked and jerked and worked; and it worked and jerked and kicked, until finally it had churned a lump of butter. When the man opened the can he found this frog sitting upon this lump of butter and floating around the inside of the can, singing,

"A life on the ocean wave,
A home on the boundless sea."

Now, that frog was endowed with the principles we try to instill into our pupils, namely, the principle of optimism or the taking a bright view of any situation, no matter how gloomy it may look. This will give him a cheerful and merry disposition and his task can be completed with one half the effort and in one half the time, and the other principle is that

of persisteney or sticking to a task until it has been completed. If endowed with these principles our graduates will make better citizens. They will make of him a better farmer if he is to be a farmer; a better lawyer if he is to be a lawyer, or a better doctor if he is to be a doctor.

Music by the orchestra.
Recitation, Mrs. Joseph Grossman.
Music by the Glee Club.

ADDRESS.

W. D. Hoard, Ft. Atkinson.

Mr. President, Ladies and Gentlemen: Before entering upon the subject matter of my talk before you this evening, I wish to dwell for a moment upon the question presented to you so clearly by the principal of your high school, the question of Agricultural Education. The question touching the elements of agriculture in the common school is interesting, not only to educators and to communities, but is beginning to interest farmers.

In Hoard's Dairyman, when we established the Department of Inquiries and Answers, we were obliged to use certain terms that are found in the agricultural industry; for instance, we were obliged, when we meant protein to say protein, when we meant carbohydrates to say carbohydrates, because there were no other words in the language that were equivalent, by which to convey the meaning, and we got hundreds of letters from farmers, good men, but men whose state and whose government and whose fathers had neglected in their youth to put them in their school, the farm school,—the only school the farmer has, the only school that ninety-five out of every hundred farmers in Wisconsin ever have any schooling in,—had neglected to put before those children, now full grown men—any informa-

tion concerning these questions that related to their life, and so they wrote us and asked, "What do you mean by protein? What do you mean by carbohydrates? What do you mean by nutritive ratio? What do you mean by ether extract?"

Now then, there isn't a farmer in Wisconsin that don't know the meaning of "telegraph." Yet it is a Greek word. There is not one that does not know the meaning of the word "telephone," another Greek word, and so today, if the farmers of Wisconsin had a clear understanding of the meaning of terms then their reading would have a very much wider and stronger meaning to them. And I plead with the farmers of this portion of the state that they make their influence felt in their own farm schools and with their County Superinendents, and everywhere, that they make that influence felt for the promotion of teaching of the elements of agriculture in the common schools, so that the boy of today, the farmer that is to be, shall have some clear equipment of knowledge, that when he strikes these words and terms in the literature of his business that he shall know what they mean. I say to you that the farmers have not half realized the importance of such knowledge.

Now, knowledge goes from one man to another by virtue of language, and if man is deficient in his knowledge of language he cannot receive from another man that which he should receive. And so I say that the common school of today, the high school, which is included in the common school, ought to be made a splendid engine for the promotion of agricultural knowledge.

I am to say something to you tonight upon a question not so closely and practically connected with dairying as it is with the construction of the man who is milking the cow.

The title of this talk is The Making of a Man, and when I am through with that I want to speak to you a few moments on another topic, for I may not have a chance to give my thought on this matter.

It is on the Evolution of the Dairy Farm. It is very fairly well known to the people of this state that for nearly thirty-seven years I have been working steadily for the promotion of dairy intelligence, in Wisconsin, and other states so far as I could, and slowly, good friends, as this convention testifies, do we see this sentiment springing up where, only a few years

ago, there was scarcely a thought or a deed that was in consonance with it.

(That portion of Mr. Hoard's address which was "not so closely and practicaly connected with dairying" is omitted at his request.)

THE EVOLUTION OF A DAIRY FARM.

W. D. Hoard, Fort Atkinson.

The progression of events towards a completed purpose is called Evolution. There may be evolution up, or evolution down; towards construction and perfection of purpose, or towards destruction and final collapse. Which way evolution takes will depend on the mind, the brain, the thought of the man at the helm.

There is no finer sight than a complete dairy farm, worked out to as perfect adaptation of means to ends as it is possible to make, and no finer ambition can take possession of any man than to construct such a farm. We instantly know it when we see it. We know that it is the result of a splendid ambition, a fine constructive mind, the logical sequence of a thinker, a student, a worker, a master among men. What a marvellous change would be wrought in agriculture if such an ambition could take possession quite generally of the minds of farmers. Suppose a young man should set out in life with this thought and purpose:

"I propose to be the owner of as perfect a dairy farm as I can make, whether it be of 40 acres or 500. Just as soon as I have paid for my land, and maybe sooner, I will start the work of building up a first class dairy herd.

Every dollar above the payment of indebtedness and current expenses is going into the construction of the right kind of barns, stables, outbuildings, yards, paddocks, etc., for the life of a dairy cow, and the proper handling of her product.

I will carry as large a herd as it is possible to keep in perfect health and the land will support, for this will give me more

manure and this give me constantly increasing fertility in my land.

As my revenue increases I will devote it to the building up of this farm factory plant, whereby still larger and better results may come.

I will try and make money, but it will not be for the purpose of investing it in notes, mortgages, stocks or bonds, until I have this Dairy Farm in as perfect shape as I can possibly make it.

I will spend no money for foolish display or vanity, but I will fearlessly spend it as fast as I can get it, to the purpose of doing first class money making work on this farm.

To this end I will try and take good care of my mind, knowing that it is the extent of my knowledge *as a farmer,* and my energy in carrying it out, that will tell the final story for me."

Think what splendid results would be now seen in every state, if the majority of dairy farms were guided and managed with an ambition like that? Many fanmers think that such a course would be wasteful of money and not a profit making venture in the end. Right there is where they make their greatest mistake. The trouble with dairy farming to-day, all over the United States, is that the farmers engaged in it are doing their work without clear, definite, ideas of what dairying means and without an uplifting ambition to excel as dairy farmers. A large number would spend more money to be elected to some county office than they would for a pure bred sire or the building of a first class dairy barn and stable. Their ideas of making money are on too low a plane.

We well remember once when a kind hearted German farmer, a neighbor, took us to task for paying several hundred dollars for a Guernsey bull calf. "You might as well throw your money in the river" said he. He thought a scrub grade sire was good enough for him. He sees things differently now since we showed him where we had sold nearly $3,000 worth of stock from that sire, with more coming on and the sire still in his prime. His last remark to us was: "If I had commenced where you did I would be worth ten dollars where now I am worth one."

It is this idea of gathering good forces together, making a complete whole of a dairy farm, with a definite ambition and

purpose that in the end blossoms out in the perfect flower; the Evolution of a Dairy Farm, the education and making of one of the noblest products of his age, a first class dairy farmer. There is money in it; there is splendid citizenship and patriotism in it; there is a grand upbuilding of your state in and of it.

Music by the orchestra.

Adjourned to Thursday, February 21, 1907, 9:30 A. M.

Convention met at at 9:30 A. M., Thursday morning, February 21st 1907. Charles L. Hill presiding.

Report of the Secretary.

SECRETARY'S REPORT.

To the President and Members of the Wisconsin Dairymen's Association: I have the honor to submit the following report, covering the period from the adjournment of our convention in Waukesha last winter to the present time.

I have drawn orders on the treasurer to the amount of $3,445.58 for the current expenses of the association. The treasurer's report will show in detail in whose favor the several orders were issued, but as has been my custom in previous years, I give a brief summary of the purposes for which the expenditures were made as follows:

Convention expenses of 1906.	$420 79
Convention premiums paid.....	125 24
	$546 03

Dairy Inspector H. C. Searles	$1,336 51
Dairy Inspector H. K. Loomis	420 10
Cornish, Curtis & Green M'f'g. Co., Outfits and supplies	52 29
Blanks for reports	18 50
	$1,872 40

Expenses of members attending meeting of the Executive Board	$15 86

SWISS CHEESE PURPOSES.

Instructor Peter Zumkehr	$924 00
John Luchsinger, legal services	50 00
Printing report	63 75
Milk for experimental purposes	18 54
	$1,056 29
	$3,445 58

There still remains to be paid as part of the legitimate expenses of the year, the salary of the secretary, $250, the expenses of his office. $94.10, a printing bill, for stationery, programs, etc., $25.40, and several outstanding accounts for traveling expenses of several officers while serving the association. When these several acounts are presented and paid, the expenditures for the year will fall but little, if any, short of $4,000, which is the amount of our annual appropriation.

As noted in the program prepared for this convention, the Executive Board, after mature consideration, considered it inexpedient to continue premiums on butter and cheese and adopted the following resolution March 22, 1906:

Resolved, That premiums on factory butter and cheese be discontinued and that premiums be offered for milk and cream for market, cheese factory, and creamery purposes, including all essential points except the per cent of fat and solids-not-fat.

Mr. Charles L. Hill with the president and secretary was constituted a committee to formulate satisfactory rules for the milk and cream exhibit. It has been found difficult, not to

say impossible, to formulate satisfactory rules for this purpose, for the reason that there were neither precedents nor experience for guidance but with the co-operation of the State Dairy and Food Commissioner and some of his expert assistants, we have arranged for such an exhibit and for judging and awarding premiums. It is confidentially expected that our experience this year will enable us to overcome in the future many of the difficulties and discouragements that have been met with in the past.

The Executive Board at its meeting last March also adopted the following:

Resolved, That the asociation discontinue the present system of instruction to creameries and cheese factories and in lieu thereof establish a system which shall deal more directly with the milk producer.

Pursuant to this instruction it was determined to make some initial experiments in establishing test associations. Several applications were received but none of them seemed to offer sufficient dairies or cows to occupy the full time of an inspector in one locality, but after some effort and delay by combining the applications from territory northeast of Fond du Lac with others from the neighborhood of Rosendale, west of Fond du Lac, a circuit was established and Mr. H. C. Searles was started in the work about the middle of May. It is expected that he will be present and report concerning the progress made. The monthly reports he has sent in show only too plainly the imperative need of such work and letters from dairymen whose herds he has visited from month to month speak very encouragingly of the benefits already accomplished.

Later in the season, Mr. H. K. Loomis was persuaded to take up a similar line of work, but on a much more restricted scale in Sheboygan county.

These inspections, to be of full value, should cover a full year. Doubtless from experience gained, these inspectors will have valuable suggestions to offer concerning methods for the future.

Respectfully submitted,
GEO. W. BURCHARD,
Secretary.

Secy. Burchard: Gov. Hoard suggests that I very briefly

explain this method of inspection to which I have referred in my report.

The inspector goes once a month to each herd; he there sees to the milking morning and night or night and morning, gets one day's milk. He takes samples of that milk and tests them and he assumes that for practical purposes this may be a sample of the entire product, of each cow for the month. If anything really abnormal occurs, he can check it up with his test for the month preceding and the month following. He makes a record of this and reports to me as secretary of the Association once a month.

I have looked over those reports with some care and it is astonishing as well as instructive to note how much different cows vary, cows in the same herd. Some hold out well and others drop off almost at once. Some start in magnificently, but they soon fall out of the race.

These inspectors also report briefly about conditions on the farm, how the man feeds and what care he gives his cows, etc., and it is instructive to note that there is oftentimes quite a relation between the faling off of the milk in the herd and the lack of proper care given to them.

I don't want to trespass too much upon this line of thought as will be developed by Mr. Searles, who has been in the work and has a paper which he will present tomorrow morning, going more into details I expect, but I am glad to call your special attention to this matter.

The Chairman: At this time I am going to appoint the following committees:

Resolutions—C. H. Everett, A. D. DeLand, M. B. Lee.

Nominations—J. Q. Emery, Prof. W. A. Henry, Mrs. A. L. Kelly.

Auditing—H. C. Taylor, C. P. Goodrich, H. D. Griswold.

Milk Exhibits—W. D. Hoard, U. S. Baer, Secy. Burchard.

At this morning session, Gov. Hoard is to occupy the chair.

Ex-Gov. Hoard: The hall seems to be pretty cold. Way back in my boyhood days, when we took sleighrides and it was chilly, we used to say, "Lay the brands close if you want a good fire," and I have always noticed that it is a good deal so with an audience. If you have a warm room and a good audience, well packed in together, somehow or other the action and reaction of the moment is more prolific. You know how

it is, you don't enjoy your meals if you sit down in a cold room and eat alone.

For a number of years it has been my fortune to know of the character of work which has been performed by one of the younger members of the faculty of the College of Agriculture in Wisconsin I have happened in the course of my life to meet a good many men who did good work.

Now, we have before us this morning a very important topic, wonderfully important to the comprehension of the practical farmer if he can be brought to see it, and I think as a rule that almost every farmer is willing to see if he possibly can have an opportunity to see.

The relationship of alfalfa and corn to dairy farming in Wisconsin is remarkably close. One little word may help us by way of illustration. Here is a circle, it is complete, we will say, almost closed at the top. I find in my practical work on my farm that corn ensilage and alfalfa hay close the circle pretty nearly and all it lacks is the keystone of a little more grain.

Now, the relationship of corn and alfalfa is remarkably intimate. Wisconsin is a good corn state, raises corn when a study is made of it and raises it successfully, and it is very fortunate for us this morning that we have one of the most devoted students and teachers in the College of agriculture with us to discuss this question, and it gives me exceeding good pleasure to introduce to you Prof. R. A. Moore, who will discuss this question as I know in a very enlightened manner.

Prof. R. A. Moore: Mr.Chairman, worthy Secretary, Ladies and Gentlemen: It is certainly a great pleasure for me to be with you. It is my first opportunity of meeting with the dairymen of the State of Wisconsin, with this particular Association which has done so much good to our state. It carries me back to my younger days in old Kewaunee county, when, through the efforts of this organization such men as ex-Gov. Hoard, Dean Henry and Hiram Smith came to our county and told us we had been soil robbers. We were growing wheat in Kewaunee county in the same way that it was being grown all over the fair state of Wisconsin, but we didn't know that we were robbers until we were told it by these men who warned us we should turn before it was too late.

There was not a single creamery or cheese factory in the

county of Kewaunee at that time, but we did turn; in a few years we stopped growing wheat upon our farms, we turned our attention to dairying and when I left the county eleven years ago to take up my work in the College of Agriculture, we had at that time 68 cheese factories and creameries in the county, and we are pulling the mortgages off our farms that has been placed there by continuous wheat growing.

That same thing took place throughout our entire state, and today the state of Wisconsin is largely indebted to what this Association has done, with the co-operation of the collage of Agriculture, for her present condition.

The state of Wisconsin had a population who were willing to learn and when they saw that it was for their interests to take up the dairy business in preference to growing wheat upon their farms, they did so, and today we have in the neighborhood of 2,995 cheese factories and creameries in the state of Wisconsin and its dairy products bring to our farmers some $40,000,000 or $50,000,000 annually, and it is right upon that subject in particular that I wish to speak.

It has been suggested that in order to get the discussion properly before the members of this Association and their friends, that I give a couple of short papers upon the topics assigned me. Then these can be discussed and before taking up the discussion, it will be well to present both these papers.

THE WISCONSIN CORN CROP.

Breeding, Growing and Dissemination.

R. A. Moore.

For many years Wisconsin has been handicapped in corn growing. Our southern neighbors have told us that we were out of the "Corn Belt," and unless we could come over into the corn belt there was little use of growing anything except flint corn in Wisconsin.

A careful survey of the climatic and other conditions seemed to show that Wisconsin was not out of the corn belt, but

was very much inside and underneath the belt proper. All that seemed necessary was to stop purchasing seed corn in accordance with the scoop shovel method and stop trying to adapt southern grown corn for our conditions. The corn needed was Wisconsin corn belt corn, bred and acclimated especially for different localities of the state. The Wisconsin Experiment Station undertook the task of developing the varieties of corn and with the aid of the Experiment Association within five years have established Wisconsin corn, "true Badger corn" in every county of the state.

Five years ago Wisconsin produced 28.2 bushels of shelled corn per acre. Secretary Wilson sends forth in the U. S. Crop Reporter the remarkable yield for Wisconsin of 41.2 bushels per acre for the year 1906. Wisconsin's yield per acre is only surpassed by the state of Ohio, which has a yield of 42.6 bushels per acre.

Parties who have not understood what has been going on in the state of Wisconsin in regard to corn breeding, can hardly realize what is meant by the figures I have given you. What that menas is this, that Wisconsin this year has grown twenty million bushels more corn on approximately the same acreage than she did in 1902.

The breeding, acclimating and dissemination of corn for various sections of the state has been an important factor in bringing about this increased yield. Like the Dairymen's Association now in session, which sprung into existence at a time to prevent the farmers from depleting their soils through constant wheat cropping, the Wisconsin Experiment Association has come to the rescue for better corn production. By the establishment of several thousand corn centers, the improved varieties have been grown and acclimated in all sections of the state and farmers now have within easy reach good seed corn, which they can purchase fire dried in the ear that has been grown under their own local conditions.

It is surprising what an association of 1200 young farmers can accomplish when all proceed in a systematic way along one line of effort.

During the five years work with corn at the Experiment Station a few things have been learned that are of vital interest to the Wisconsin corn breeder and will be herewith given with the hope that some farmer will be benefited thereby.

For improvement of yield we should observe careful selection of seed ears when stalk study is permissible. The ears should not be taken from the stalks until well matured. Seed corn should not be dumped on a floor, but hung in a well ventilated room or top of corn crib to dry. A well ventilated furnace room is an admirable place to cure corn. Small outside building, well ventilated, with corn racks arranged and shielded, stove in center of room is preferable for drying large amounts of seed corn. After seed corn is well dried, it will stand cold weather without serious results.

The ear we desire should be cylindrical and true to type, tapering ears are objectionable as they do not carry uniform kernels. Kernels should be of medium depth and of practically the same width from butt to tip of ear with edges fitting closely from crown to cob. Ears having sixteen to twenty rows are preferable for our latitude, as by carrying that number of rows, they dry out more readily than if carrying more. A slightly roughened seed coat is desirable and the corn should come well down around the shank, which should be of medium size. The tips of the ears should be fairly well filled, but do not discard the ear if a few tip kernels are missing when other good characteristics are present.

Ears should be of uniform size, 8 to 10 inches in length, and 6 to 7 inches in circumference. Uniformity in size of ear usually carries with it uniformity in size of kernels.

The secret of good crops is largely in the seed. Only the best should be planted. No uniformity of stand can be secured unless seed has good germinating power. All corn of doubtful character should be tested. General test should first be made by taking at least two kernels from each of fifty ears and making test in simple plate tester. If test is from 98 to 100 strong and vigorous, and corn was cured under similar conditions, the farmer can be reasonably certain the corn is all right. Resort to the ear test if general test is low, or if any doubt exists, as it will amply repay for time and trouble.

Before testing make general selection of ears that have kernels of about the same size. Use planter plate that will plant by check row system three or four kernels to a hill. Stay by planter until it will drop four kernels eighty out of a possible one hundred times.

Shelled corn should not be purchased for seed. Every corn grower should insist on having seed corn shipped in the ear so that he can test the same before planting and discard it if of no value. There is no good reason why any honest corn dealer should refuse to sell corn in the ear.

Bear in mind that in order to lock the vitality of seed corn in the kernel until time of planting, the corn should be fire dried and then stored in a safe place.

Chairman: Please speak further in regard to curing corn in basements of buildings.

Prof. Moore: Farmers having furnaces in the basement of dwellings for heating purposes can use the furnace room for kiln drying corn. The corn can be strung on wires or slats or the ears tied so as to be suspended from the ceiling. The windows should be opened so as to have free circulation of air and the furnace run as to have the heat retained as far as possible in the basement. Where a corn grower hasn't this convenience and where the desire is to cure a very large quantity we advise a regular corn curing building.

Chairman: Do you furnish plans for these curing rooms?

Prof. Moore: We give general directions. we have not any elaborate system. We have told a great many of our members of the Experiment Association to go ahead and take any of their old outstanding buildings and put little corn racks in them and put in a shielded stove in the center of the room, and before going to work in the morning, run in and start a fire and keep the corn in there for a couple of weeks. Do not fire too heavily at first, but have a slow heat the first day or two, and windows well open, be very careful that there is good circulation of air in the room, otherwise the corn will be bathed in moisture that is driven off the corn.

Chairman What do you mean by "ear" test?

Prof. Moore: I mean to go to your corn racks, wherever they are, and select your ears of corn and lay them on a table in rooms having them all numbered. Take out from four to six kernels, usually four are sufficient. One hundred ears would be sufficient to plant at least eight acres of corn. It doesn't take very long to select out one hundred ears that are uniform. Number them and take out four kernels from dif-

ferent parts of the ear. We have a little board box and we put sawdust in the bottom and nail a cloth, which has squares drawn upon it that are numbered. This cloth is drawn over the sawdust and tacked to the sides of the box. Then the kernels from ear No. 1 go into square No. 1 and so on down. Then we have a little sack that we fill with sawdust and moisten that goes on top of the corn in the tester. After the corn has been in the tester three days we look at it and most of the kernels will have germinated at that time, but we cannot tell the character of the germination so well until about five days have elapsed. Then we go to the box and here we will say is square No. 10 with four kernels in it, and two of them have failed to germinate and the other two weak. We cast ear No. 10 out as we know that something has occurred to injure the vitality. We figure that a thousand plants would be produced from this ear if the kernels were all good, but something has happened to this ear that has made it a poor ear, and the only way of telling whether it is good or poor is to put it to the ear test. No man will make money so fast as he will while testing corn. Now, then, we will go to square No. 25, and find something is the matter with the germination. We will see that the vitality has been injured to a certain extent and we throw out the ear to be put into the feed box. You may find there will be five or ten ears out of a hundred that something is the matter with the germinating power, and they should be discarded. Only keep those ears of corn to plant that give a vigorous germinating test.

For Wisconsin conditions the only true method of curing corn is to fire dry it. When we harvest corn, even though it looks to be well matured, it has from 25 to 30 per cent of moisture in it, nearly one third moisture. Even though we have considerable good weather after harvesting the corn, the moisture content will not be reduced more than five or ten per cent, so when freezing weather comes the corn having eighteen or twenty per cent or moisture in it, is injured or rendered entirely unfit for seed. The water freezes within the corn and the germ is destroyed and even though some of the kernels germinate, the vitality is knocked out of the corn. We wish to have the vitality and the energy, locked into the seed corn so that it will come forth after planting and produce a good stalk and at the same time produce a good ear.

By going through a field of corn you will find a great many barren stalks, the seed producing these stalks had just sufficient vitality to produce the stalk and perhaps put out a little nubbin. If your seed corn is fire dried and you secure the vigorous ears by testing, you will find in your field annually a less number of these barren stalks, and a less number of stalks that will produce nubbins.

We have bred, at the Station, a variety of corn that will produce merely one ear to the stalk. You will find it characteristic of this Wisconsin No. 7 to produce one good ear to the stalk. You might say, "Wouldn't it be better to produce two or three ears of that same corn?" You would thereby have a lower grade of corn. The high grade seed corn you can sell at $3.00 a bushel. So we wish to breed a corn that will give as many bushels as possible of this $3.00 corn. If we have more ears to the stalk, we are going to have a great deal of the other kind of corn, the twenty and fifty cent corn. When we started working with corn, we thought five ears out of a hundred that we would not be ashamed to send out for seed was pretty good. We have gradually been working up, so that this year we got about twenty per cent of ears that would go into the seed corn lot. We made three divisions of the corn, namely, the seed ears, the feeding ears and the nubbins. We are striving to reduce the lower grade of corn and raise the higher grade, and this we are accomplishing through our single row tests.

Mr. Taylor: Is it delivered to the purchaser in the ear?

Prof. Moore: Yes, we do not believe in the scoop-shovel method of selling corn.

ALFALFA IN WISCONSIN.

R. A. Moore.

Wisconsin is a great dairy state and her dairy products brings to her farmers some fifty million dollars annually, but a considerable sum of this money is spent by the farmer for

high protein feeds. Oil meal, oil cake, cotton seed meal and bran are purchased by our dairymen for the protein these feeds contain. These feeds are high priced and often farmers living at a distance are obliged to spend much valuable time on the road bringing home these feeds after they have been purchased at a good round sum. It seems to me that the Wisconsin farmer has reached that stage in development, when we can solve this trying problem, and grow his protein feeds on his own farm. We know he can, as many of our best dairymen are already doing it, and keeping their protein money at home, instead of sending it out of the state annually.

The alfalfa plant has come to help us out and as soon as we learn to grow and care for this great plant, the problem of protein mixtures for our carbonaceous feeds is solved. The man who may have tried the growing of alfalfa without success, should not feel discouraged, and should remember we are working with a wonderfully mysterious plant. A plant that can build in its tissue 18 per cent of protein matter and secure the larger portion of it from the air, and much of the other feeding elements from many feet below the surface, of the ground, is worthy of our best judgment in the establishment of the same upon our farms. No better inheritance can we leave to our offspring on the farm, than good established fields of alfalfa and a knowledge of how to grow the same.

An organization that has come to the dairymen in times of need is now in session, and may we not spread broadcast throughout our state some information that will enable the farmer to solve forever the question of high protein feeds. During the past eight years at the Experiment Station, we have successfully grown alfalfa, and no less than eight hundred members of the Experiment Association are growing alfalfa as object lessons in all the older sections of the state. We hope to be able to present to you a few facts bearing upon the growing and handling of this coming forage plant.

Test the Seed. Seed should be tested before purchasing. Use the simple plate tester. Farmers should write seedmen for sample or seed and test the same; if the seed does not test 90 per cent or above, do not purchase, but try another firm. The character of the germination should be considered, as well as the fact that the seeds germinate.

Reasons for Failure to Procure Good Stand. Seed of low

vitality has been the principle reason for numerous failures in the past. Sow the seed on well-drained land, south slope preferable. Do not sow on low, moist, or heavy red clay soils. Use twenty pounds of seed per acre, and if the land is weedy, use one bushel of barley or oats as a nurse crop. If the nurse crop does not lodge, let it mature and harvest in the usual way. Under very favorable conditions, a cutting of alfalfa can be secured the same season of sowing. Do not cut alfalfa after September 10th.

Soil Inoculation. In many portions of Wisconsin, alfalfa plants readily develop the proper nodules on the roots without artificial inoculation of the soil. To insure a good stand it is safest to scatter bacteria laden soil on the surface of the ground, just previous to sowing the alfalfa seed. Soil taken from an old alfalfa field or where sweet clover (Melilotus alba) grows, contains the germs that act in a beneficial way on the alfalfa plant.

A good plan to get the proper bacteria into the soil is to put some alfalfa seed with our clover mixture we desire to sow. a few scattering alfalfa plants will become established in our clover field, and act as bacteria distributors, until whole fields will become properly infected with the essential germs for the proper development of the alfalfa plant.

When to Cut. Alfalfa should be cut when coming into blossom, and not too close to the ground. Hay caps to cover alfalfa and protect it from dew, rain and sunshine, are desirable. One-half the value of alfalfa hay may be lost if it is not properly protected.

Feeding Value. Alfalfa hay has nearly the same feeding constituents as bran and should be regarded on a par with grain feed by weight for dairy cattle.

Do not pasture your alfalfa fields which you desire to cut for hay, as alfalfa is readily killed by close pasturage. A top dressing of well rotted manure aids materially in producing a good crop.

Fields which you desire to sow to alfalfa should be fertile, well drained and well manured in order to get a good stand from the start. In old hog pastures or cattle yards, there seems to be very little difficutly in getting alfalfa established at first seeding.

I have here a sample of alfalfa seed grown in Wisconsin,

true Badger seed, which gave a yield of four bushels per acre. We have already made germinating tests of this seed at the Station and found it to be 95 per cent. The price of alfalfa seed at the present time is 15½ cents a pound, about $9.50 per bushel. So you see at four bushels to the acre, a man can get $38.00 for the seed from an acre of land after getting one good cutting of alfalfa hay. It will be a blessing to our state when more members of our Association grow this seed; they will find a ready market for all the Wisconsin grown seed they can raise.

The young man who grew this seed, took first prize at the Annual Meeting of the Association.

Four years ago when the Experiment Association received its first annual appropriation of one thousand dollars from the state, we used the larger portion of the money to buy alfalfa seed. We were very careful to get good seed, consequently made many germinating tests of seed from different seed firms before placing our order. We were surprised to find some of the germinating tests run as low as twenty percent. Any farmer who sows 20 per cent seed is doomed to failure from the beginning. We got other seed that tested 98 to 100 and that is the kind we purchased, you may be sure. Fields today that were put in from this seed are giving annually three crops a year, and have established the fact in many counties where they were not growing alfalfa at that time, that we could grow and develop this great forage plant.

Be careful before purchasing alfalfa seed that you make the test. Send it down to the Station, if you have any doubt, and we will make the test for you, and report on the purity as well as the germinating quality of the seed.

Chairman: Do you as a rule get a cutting of alfalfa the same year of seeding?

Prof. Moore: It is only occacionally we get a cutting of alfalfa the same season of seeding. We have done it at the Station farm. We got two and a half tons to the acre the first year, and the next year we took four crops from the same field, but it is safer not to cut the first season and never cut after September 10th.

We have a plant commonly known as sweet clover growing along our roadsides, that is performing very important mission in spreading the germs necessary for the growth of alfal-

fa. We passed laws putting sweet clover among noxious weeds, we started out with the determination to cut it down and exterminate it, but the plant is quietly performing its great mission in life by paving the way for alfalfa. When we realize the great mission this plant is accomplishing, we will be willing to let it grow alongside of the road unmolested.

The reason in many parts of Wisconsin that we can get a good stand of alfalfa today is because this same sweet clover is growing by the roadsides. The sweet clover germs which are beneficial to growing alfalfa are washed onto the adjoining fields and the ground filled with the bacteria which are necessary for the growth and development of alfalfa.

Chairman: You spoke of getting the land inoculated by sowing a mixture of alfalfa and clover seed, please explain further.

Prof. Moore: In sowing alfalfa with clover, the few plants that become established among the clover plants, if but one plant in fifty the germs seem to act on it and that plant will look vigorous. Nodules develop on the roots of these plants which release sufficient bacteria so that whenever the clover sod is turned up and we sow alfalfa upon the field, we are pretty sure to get a good catch of alfalfa and practically all plants will develop the nodules when we follow the above practice on high well drained soils.

DISCUSSION.

A Member: How would it be for the farmer who was not selling seed to shell it and put it in a bag after having fire-dried it, and put it away?

Prof. Moore: In some respects that might be all right. Of course there may something have happened to the corn that he is not aware of and he would not be able to test it to advantage if it has shelled from the ear. Now, if this corn was going into a breed test I would not advise that at all. If it was just going into a general field, it probably would be all right and be safe for him to make a general test, but if it was going to a breed test, I would fix it so I could test these ears before putting them into the test.

I did not speak of our system of breeding. It is practiced by the members of the Association, nothing hard about it. We go to work and select 50 ears and finally we select the smallest ear, the one which has the least number of kernels, and we reject the tip and butt kernels so as to get uniform kernels and we will plant this ear in a row, putting in three or four kernels to the hill, whichever we decided on, three feet eight inches and four feet apart. Plant it as far as it will go.

Then take this next ear and so on down through until we get the 50; we usually run 50 ear tests. Now, when it comes to looking over this corn and the selection, we begin at a time before the corn has fully ripened; for instance, if we wish to fix early characteristics and wish them to be prominent in some of this corn, we will go through when some of the early ears begin to ripen up and we will mark these stalks on which these early ears grow. At the same time, we wish to have this corn selected with reference to the stalk, we want to consider the characteristics of the stalk, there is a great variance, for instance, in the leaf development of the stalk. Wisconsin farmers use a great deal of corn for forage purposes or for the silo. Consequently, we save ears of the leafy corn. This No. 7 corn is the most beautiful corn in that respect that I have ever seen grown. You select a very leafy stalk.

Corn is one of the most beautiful plants to deal with you ever saw, because you can breed any of the characteristics you desire into the corn plant, and we have developed a variety of corn which has an excellent stalk, nice and leafy. Of course this corn that you are selecting must be left, it must not be picked. A great many farmers make the mistake and go in when the first husks of the corn begin to turn yellow and they pick those ears off and put them in a bag and take them home thinking they are going to get early corn. Well, they are going to develop that characteristic in the corn to a certain extent, but at the same time, they have lost a most essential thing in corn; that is, they have lost the vitality, the energy, which goes into the corn just during the last few days of the ripening period, and that is what we want in corn, if it is going to have sufficient energy and vitality locked up in it to put forth a stalk and good ear it must be left to get the

benefit of those last few days, because that is what they lose by selecting in the way it is so often done. But, mark the stalk, and after it is well ripened up, go in and gather your selected ears and you have got those qualities you are after.

The Chairman: Do you make any study of the character of the stalk, as well as the character of the ear, I mean the vigor of the growth of the stalk?

Prof. Moore: Yes, we study that. We size the corn stalk up just as you would if you wished to select an important man to put in an important position. Make a general selection.

The Chairman: Your idea is that the vigor and appearance of the stalk itself is of importance as well as the appearance of the ear?

Prof. Moore: Yes, very important indeed. Now, for instance, each ear has its identity just as closely as the identity of a man. For instance, we find in the human race we have a class of men that is always behind, never get up, it seems as if they are born two or three hours late in the world and never catch up. Then we have another class of people who are able to hold their own and keep up with the world's progress and not only to hold their own, but to go beyond the general average, and so it is with corn. We have some corn that is going to drop back just as some dairy cows are a detriment to the herd, they will never catch up. So it is with corn; while, on the other hand, we have come to where we can produce three times as much good corn under the same conditions, the land plowed in the same way, cultivated in the same way and seemingly the same kind of corn at the beginning. But to come to our seed corn again. The next year we plant from our high yielding row and our whole yield is going to be high and that is how the yield rises, and that is the reason that we are getting from 75 to 100 bushels of corn to the acre, because we have thrown brains into the work; we have a thousand young men doing that, throwing brains into their work of breeding corn and that is one reason why we are able to give you the results that we have.

A Member: Would you advise shelling another year?

Prof. Moore: No, for two reasons. We reject the tips and butts for two reasons, one is because they are tardy in the germination, about three or four behind in the germination, so if they are planted with the other kernels these tip and

butt kernels come on about four days late and are shaded during the whole growth and they never have sufficient vitality to produce a good year. Another reason is that they are not the same size and will not plant in the same way, the planter will drop six or seven kernels down into the hill where you only want four.

The Chairman: Do you go through a field of corn and cut out the barren stalks?

Prof. Moore: No, sir, we haven't done that to a very great extent. There is a great doubt upon that particular subject as to whether or not this is a breed characteristic. A great many of the best corn breeders think that it is and while I may be convinced otherwise, I think that it is not a breed characteristic. I think that barren stalks are largely the result of corn that is planted that has not had vitality and energy locked up in it.

Mr. Goodrich: They are sometimes large stalks, are they not?

Porf. Moore: Yes, occasionally the corn has sufficient vitality to put thrift into the stalk, but, as a rule, it is not so.

A Member: In your selection of seed corn, when you go through the field and mark certain stalks, how would you mark it?

Prof. Moore: I would either use a little string or one of these clasp clothes pins.

The Member: How would you know that it is the proper kind of an ear? Would you rip off the husks?

Prof. Moore: No, I would just select about three times as many ears as I thought I would need. You can go through and mark enough stalks to make two or three hundred ears in a very short time. I mark about three times as many as I need and about from fourteen to sixteen ears of corn like this that I have here would plant an acre.

The Member: And the corn that is marked should be cut at the proper time for fodder, should it?

Prof. Moore: Oh, no. After the corn is all ripened up and it is all right, the leaves have stopped performing their functions of putting energy and vitality into the corn. We like to leave the seed corn until it is all ripened.

Mr. Everett: What the gentleman wants to know is, if

you cut that ear of corn at the time when you are cutting corn for the best feeding value for fodder.

Prof. Moore: You ought to leave it there in order to get more vigor.

Secy. Burchard: How do you harvest this seed corn?

Prof. Moore: We wish to cut our fodder corn a little earlier than the seed corn. Our desire is to leave the seed to receive as much vitality in the ear as possible, while in the fodder corn we want the vitality scattered through the whole stalk, consequently where we are growing for seed, we let the corn ripen up at the expense of the fodder.

A Member: You might select your seed in one strip.

Prof. Moore: Yes.

The Chairman: It is a good thing to plant the corn you intend for seed by itself.

Prof. Moore: I wish to state here that we have here three or four of the varieties of corn that we have developed in Wisconsin. Here in Wisconsin No. 8; this was developed for the lake shore counties. We grow it up to within twelve miles of Lake Superior and forty-seven bushels of shelled corn have been harvested. The people up there were very much surprised. They thought they could not use flint corn up there. So we are looking forward to the time when we can push this corn belt way up to Lake Superior.

Here is another very nice yellow corn that was rather late. It is a nice corn, known as the "North Star," but it is later than the other. In order to get a medium variety, we crossed these two and we produced a cross-bred corn which is called "Golden Glow" and we have been carrying on special tests to know whether the characteristics in that corn are sufficiently settled so that we will be able in a couple of years to establish that corn.

Here is another, "Clark's Yellow Dent" that was grown by a farmer by the name of Clark and we got a nice yellow corn. However, that No. 7 is the highest yielder we have in the state.

The Chairman: This is a very important discussion, and I wish we had time to continue it, but we must go on with our program. Our next topic is "The Relation of Feeds to Profitable Dairy Farming." For a number of years it has been my fortune to do lecture work in the state of New Jersey and

in many other state, and I have come to regard with very great respect and confidence the work of one man in that state, which is in many particulars like that of Prof. Henry's in Wisconsin and is revolutionizing the farm judgment of New Jersey. He bears the same relation to New Jersey that Prof. Henry bears to Wisconsin—God bless him, we are to lose him; Prof. Henry for ill health must retire, and sadness fills the hearts of all the true good farmers of this state.

I know that Prof. Voorhees has held the same relation, very nearly, to his state. Last May I visited him on the state farm at Princeton, and I was powerfully impressed with the quality of his thought and his work as it was seen there by demonstration, and I take exceeding pleasure in introducing to you for a discussion of this, a very important, subject, a man who has made his mark all over the United States and largely so in Canada and elsewhere, Prof. Edward Voorhees, Dean of the Agricultural Experiment Station of New Jersey.

Prof. Voorhees: Mr. Chairman, Ladies and Gentlemen: It is certainly a very great pleasure to me to come into Wisconsin. We have been looking toward Wisconsin from the East for a great many years and we have received a great deal of the inspiration that we have in dairy farming, from Wisconsin men.

I like to look a body of farmers in the face. I like to speak face to face on these and other matters that are so practical, so important to every one of us. In my experience in New Jersey I have always felt that it is not so much the new thing that we take to the farmer, as it is to impress upon him the value of the old things; the value of the underlying principles; so that in coming to you here today I do not propose to bring to you something very new or very remarkable, but to present in a simple way some of those very important underlying principles which have to do with the development, not only of the man, but the development of the man's farm and ultimately increase his financial profit.

We of the East are farming on soils that are poor, many of them poor originally, many of them poor because they have been exhausted of their fertility; so that our work for a long time has been to get the farmers to understand this whole question of fertility, how to maintain it, how to build it up.

We have been working along the line of fertilizers a great

deal, but recently we have been working more particularly along the line which shows the farmer how he may prevent, or how he may escape, the necessity of the purchasing of so much fertility.

FEEDS IN RELATION TO FERTILITY AND PROFITABLE DAIRYING.

Professor E. B. Voorhees, New Jersey.

It is very much like "carrying coals to Newcastle," to have an Eastern man attempt to assist Western dairymen in the development of their business. The farmer of the East, who from his exhausted acres is trying to maintain his dairy, looks toward the West, with its boundless wealth of fertility, for information concerning this great industry. Moreover, a state like Wisconsin, whose dairy products have increased at the rate of $1,400,000 per year for the last 35 years, should, it seems to me, be able to give the Eastern farmer much valuable information concerning the proper management of the dairy business, and I am glad to say that the progress that we have made is largely due to the inspiration given us by a Wisconsin man. The Eastern dairymen are largely engaged in studying how to build up their exhausted soils in such a way as to enable them to raise food for their cattle. That they have succeeded, in a degree, does not make them any more capable of giving assistance except in so far as the dairy business has a relation to that important, and I may say vital, question of fertility. The subject of my address, therefore, is a fortunate one, because it permits me to digress when there is any approach to deep water in the matter of technical dairy problems as you have them in the West.

From the earliest times, the methods of farmers have been such as to make it seem to be a far cry from feed to fertility. In all countries until quite recently, and our own country is no exception to the rule, people have been so intent upon the accomplishment of some one thing, and so absorbed in but one

phase of a question, that they have not taken the time to study the relation of the work which they are doing to that which other people are doing, and thus pursue irrational and wasteful methods; this is quite as true of the farmer as of any other class of citizens. We are unable to appreciate the relation of one part or branch of farming to all the other parts. For example, farmers when they are making up rations for dairy cattle, think principally of the effect of the ration upon the milk flow, and not of the relation of the preparation and use of that ration to soil fertility in its various phases, and its influence upon the present and future dairying of the country, though these, as a matter of fat, may be quite as, or even more, important in the long run, than the effect upon milk flow. In this country, we have been particularly derelict in our study of fertility, and it has not been confined to the farmer, but is true of all classes of citizens—of our statesmen, even, who are presumed to have a patriotic interest in the future prosperity of the country. At present, there is a feeling upon the part of businessmen, in lines which have no direct connection with farming, that questions concerning the soil have been neglected too long; they are beginning to inquire what of the future? They now realize that all true progress is based upon soil fertility, and the relative rapidity with which soils become so far exhausted as to prevent the growing of profitable crops under old methods, raises the question with them as to how much further this can go without such a reaction as to cause serious changes in our commercial relations.

Soil Fertility.

In order, therefore, that we may have a basis for our discussion, we will look at this question of fertility briefly. What is it? What are the essential principles of it? How can it be conserved, rather than wasted? In the strict sense, the potential fertility of our soils, that is, the possible crop-producing power, is finally measured by the content in them of certain constituent elements that exist in soils in very small amounts relative to the others, namely, nitrogen, phosphoric acid and potash. That is, the power of the soil to produce plants would end were any of these three constituents absolutely removed, even though all of the other required elements

were present in abundance. This is, of course, only theoretically true, as the chances are that even when soils are regarded as exhausted, they still contain a very considerable quantity of one or more of these constituents. Furthermore, active fertility, or that which is possible for the plants to obtain, is influenced by other conditions, as, for example, climate, season, location, presence of vegetable matter and a number of other factors, which enter in to make it possible for us to grow plants, but were all of these factors present, and the others absent, plant production would be impossible. The soils in our country were originally so rich in these fertility elements and the climatic conditions have been so favorable that the apparent necessity, not the actual, for the study of this question has not appealed to us as it should. Farmers have gone on their way year after year, planting their seed, cultivating their crops, and selling their grain, until the crops now raised show that something has been removed that was there formerly, they find that they connot now secure crops large enough to make the business pay. This has been the experience from the earliest times; other countries than ours have been subject to the same methods, and when the conditions have become so bad that profitable crops could not be secured, they have not attempted to improve, but have moved elsewhere, and to this country, and when the soils in the East have become partially exhausted, they have gradually moved westward until even the rich soils here do not possess their former power of crop production, and they are now seeking the virgin fields of Canada and other countries. The system practiced has resulted not only in the removal of the essential fertility constituents, but has changed the character and composition of the soil in such a way as to make it impossible for the plant to readily obtain the plant-food still present. Take the question of the sale of crops alone:

	Nitrogen, lbs.	Phosphoric, lbs.	Acid. Potash, lbs.
Every ton of corn that is sold from the farm removes from it	36	14	8
Wheat	47	16	10
Rye	35	16	11
Barley	30	16	10
Oats	41	16	12
Buckwheat	29	9	4
Flaxseed	72	28	20
Cottonseed	62	25	24

That is, by this continuous sale of crops there has been a rapid removal of the basic elements of fertility which sooner or later will reduce the amounts below the point where profitable yields may be obtained. One other point of very great importance is also clearly shown by this tabulation, namely, that of the three constituent elements, nitrogen exists in the greatest proportion. Experiments conducted in this country and elsewhere show, furthermore, that it is not a question of the simple removal of these constituents, but that the character of the farming determines whether the soil shall lose nitrogen in addition to that carried away in the crop. Prof. Snyder, of the Experiment Station in your neighboring state of Minnesota, has shown the effect of continuous cropping upon the fertility of soils, having reference both to the loss of the constituent elements mentioned, and to the changes which take place and unfavorably affect the physical character of the soil.

He shows that a virgin soil, which contined 47.64 per cent of insoluble matter at the beginning of a ten years' period of exclusive wheat farming, contained 55.12 per cent insoluble matter at the end of the period; an increase of 7.48 per cent. At the beginning of the experiment, it contained 15.55 per cent of volatile, or organic, matter, and but 5.58 per cent at the end; a loss of 9.97 per cent. It contained 5.34 per cent of humus at the beginning, and 3.12 per cent at the end; a loss of nearly one-half. Because of this loss, its capacity to absorb water, which at the beginning was 75 per cent, was at the end but 58 per cent. In other words, the continuous cultivation of wheat for but ten years increased in a marked degree the percentage of insoluble matter, and decreased the water-absorbing power. In reference to the constituent elements, it was shown that in the beginning it contained .38 per cent of nitrogen, and at the end .24 per cent; it contained .38 per cent of phosphoric acid, at the beginning, and .31 per cent at the end. It contained potash at the beginning amounting to .54 per cent and at the end .50 per cent, or a very considerable decrease in the nitrogen and mineral content of the soil The relation of method of cropping and management to fertility, is more clearly shown in another experiment, in which a comparison was made of continuous wheat growing, and of crop rotation. The soil contained in the beginning of the experiment .221 per cent nitrogen, and at the close of the ex-

periment, with continuous cropping, .0193 per cent; an annual loss of nitrogen of 24.5 lbs., due to crop removed, and of 146.5 pounds, in addition to that removed in the crop. In a rotation of wheat, clover, wheat corn and the manure used, the nitrogen in the beginning of the experiment was 0.221 per cent, and at the close of the experiment 0.231 per cent, or with the removal of 44 pounds of nitrogen in crop, there was an annual gain of nitrogen of 61 pounds. The wheat yield, with the continuous wheat raising was 12 bushels per acre, and with the rotation of crops 17 bushels per acre. I cite these experiments to show that the method of cropping has a very important influence upon the question of loss or gain of nitrogen, and upon the decrease or increase of the crop-producing power of the soil. This matter of nitrogen is of the greatest importance, because it is not only required by plants in relatively large amounts, but because the system of farming determines whether it shall be gained or lost. He also discusses another very important phase of the question which is apropos in this connection, namely, the influence of stock growing, which includes dairying, upon the question of fertility. Taking as a unit a quarter section, and raising flax, oats, wheat and barley, he shows that in average crops grown there would be sold from the farm, in one year, under the old system of practice of grain selling:

6950 pounds nitrogen,
3080 pounds phosphoric acid.
5670 pounds potash.

Where butter, young cattle, steers, flax, rye and other crops were sold and where clover, timothy, corn, mangels, potatoes, barley and oats are raised and consumed on the farm, there was removed from the farm, under this system, but:

781 pounds nitrogen,
259 pounds phosphoric acid,
149 pounds potash.

Or, in other words, the sale of grain results in increasing the sale of fertility by nearly ten times over the system of mixed farming, including dairying. While, as pointed out in the other statement, the soil had not lost in its physical properties but had rather gained, because of the added manure, and the rotation of crops.

This question of nitrogen is, also, important from another

standpoint, because it is the one element which, under certain conditions, is not so readily available as the other constituents. For example, it has been found in older settled countries, and even in our eastern states that have been growing crops for a long time, that the nitrogen that is contained in these soils is less available than in the virgin soils. This fact is so apparent that it has been said by an eminent German experimenter, that water and nitrogen govern the yield, and the net profit, in farming. Another eminent experimenter, Dr. Paul Wagner, asks: "Is this view correct? May it be accepted, as a rule, that where there has been a poor crop, deficiency of moisture, or hunger for nitrogen, or both, are the principal causes? May it be accepted as a rule that when a field needs manuring, it requires, in the first place, nitrogen, and only in the second place phosphoric acid and potash, in order to secure maximum yields?" With these questions before him to answer, he has conducted a large series of experiments on the soils of Germany, which had been wastefully farmed for a long time; a system, however, less wasteful than that practiced in this country, and he finds it to be a fact that nitrogen is required before everything, and that only in the second place is phosphoric acid and potash required. These results being obtained by pot culture, the experiments were then duplicated in the field, for a series of years, to obtain average results, and on a wide variety of soils, ranging from light and sandy to heavy clays, and confirmed the pot experiments—all soils were found to be essentially poor in available nitrogen. That is, if either phosphoric acid or potash were omitted from a complete dressing, the yield fell regularly, but if nitrogen was ommitted, the yield fell in a very striking manner.

In order to avoid any possibility of accident, further experiments were made upon the soils showing a composition of .13 per cent phosphoric acid, .12 per cent of potash and .14 per cent of nitrogen, and on the mean of three years' experiments, he found that only 2.6 per cent of the nitrogen in the soil was available to the plants. The nitrogen in these soils, though contained in average amounts, was shown to be of difficult solubility. The soil bacteria that have to do the business work slowly. It is clear, therefore, that even when a chemical analysis of a soil shows much nitrogen, the soil may remain poor in nitrogen, so far as the plants are concerned.

These experiments, as already pointed out, were carried out upon soils that have been farmed for a long time, under wasteful methods, and my object in bringing the matter before you now, is to show that if we are to avoid this condition in this country, we must have a definite knowledge of the relation of feeds to the fertility of our soils and the important role enacted by nitrogen, not only in the preparation of rations, but in improving our soils. We must more clearly realize the fact that a judicious rotation, coupled with a rational live stock industry, is the only method by which we may prevent losses in our soils, and thus ultimately require purchased fertility, and this fact applies quite as well to Wisconsin as to the states further east. Years ago, when the soils of the New England and Middle States began to show the effect of the continuous sale of grain, by a reduction in the crop-producing power, many of our farmers migrated to Ohio and Illinois, where it was claimed that the fertility was so great that no attention need be given to the question of soil exhaustion, but a continuation of the original method of practice for sixty to seventy-five years in Ohio, has revealed the fact that now the soils are showing the results of improvident methods. The sale of wheat oats, corn and hay has so reduced the quantity of the available fertility elements, and has so changed the physical character of the soils as to make it necessary now to apply commercial fertilizers, or to increase the production of manures, if they are to realize from them a profitable return in crops.

Dr. Thorne, of the Ohio Experiment Station, has wisely taken up this question, and his experiments, planned to include a wide series of crops and cover a long series of years, are liable to become quite as classic in their way as those of Rothamsted, England. His study of the use of fertilizers, and particularly of the value of caring for and utilizing to the fullest extent the yard manures, is of the greatest importance in the East and will be to those in other states, which have carried on farming in a similar manner, and which I am quite sure includes some parts of Wisconsin and of other of the northwestern states. These northwestern states have been engaged very largely in the growing and selling of wheat, barley and flax, without direct return to the soil of the constituents removed thereby. Wheat goes either as a whole grain to foreign countries, or is manufactured into flour, and the refuse

products, bran and middlings, are shipped in large part to foreign countries, a little being dribbled out here and in the New England and middle states. The "beer that makes Milwaukee famous" is derived partly from the barley grown in Wisconsin, and the refuse products, brewers' grains and malt sprouts, which remain are not retained to improve your rations, and to save your soils from exhaustion. The oil in the flax-seed, which contains only the carbon, hydrogen and oxygen derived from the air, is extracted and retained in part, but the linseed meal, that most excellent feed, and rich in fertility, is shipped to Europe, and in such great quantities that the European markets fix the prices that the farmers here have to pay for it. The gluten feeds derived from our corn, so excellent as a source of protein, are also largely exported; they contain the fertility elements, while the starch or sugar remaining contains only the sunshine, which is free to all.

This kind of farming can be continued possibly for some time to come, but those following you, will find, as has been found in Europe and in the Eastern and Middle States, that the point will soon be reached when, unless this relation of feed to fertility is understood and practiced, the farming industry here will have been materially changed, and the question of importing fertility be brought home to you in a very practical manner. There is no real objection to the selling of grain; the objection comes in not utilizing the refuse upon the farm, and thus limiting the rapidity with which the soil is exhausted, particularly of its most important constituent, nitrogen. The question, hwever, is not only a question of manure, but one of quality as well. The various products used for feeds vary in their digestibility. This also, has a direct relation to immediate or available fertility. If we feed only the roughage of the farm, mainly mixed grasses, corn fodder, or silage, we have less of valuable manure than if with these are added the clovers, and the fine feeds, containing high percentages of protein, because these show a higher rate of digestibility. The point here is, that the digestibility of the ration measures to some extent the quality of the nitrogen that will be contained in the manure.

THE IMPORTANCE OF NITROGEN IN RATION MAKING.

I am sure that by this time you are wondering when I am going to touch the question of the relation of feeds to fertility, and profitable dairying, as I seem to have been discussing fertility in an abstract and impractical way, particularly in reference to nitrogen, a matter which you may readily admit is of the greatest importance in the East, but is probably of no particular interest to you; what you are looking for is something practical, which will help you improve your everyday business. Let us, therefore, look at the ration side of the question. The investigations that have been made in reference to the preparation of rations for farm stock show one thing to be paramount above all others, namely, that cattle foods must be so proportioned as to give to the animals that amount and proportion of the various classes of substances as shall best meet the demand of the animal for the particular kind of work that it is to do, and further, if the farmer is to get the best results from his feed, either in milk, or flesh, or work, he must see to it that there is at least two pounds of digestible protein in the daily ration for a 1,000 pounds of live-weight of animal. This percentage will, of course, vary slightly according to the object of feeding, location, the season, climate, prices of feeds, conditions under which the animal is fed, etc., but it is a fair assumption that two pounds should be present, if we are to give the animal a sufficient amount of this substance, and thus most economically obtain these various objects.

Protein is, however, only another name for nitrogenous substance. In other words, nitrogen is the base of protein, and if we are to secure at least two pounds of digestible protein in a ration, we will find that it requires at least 2½ pounds of total protein. This is based upon the average digestibility of the various products used in making up rations. For example, on the average, in corn fodder and silage 55 per cent of the protein is digestible; corn stover, 45 per cent; hay and grass, including clover hay, 60 per cent; alfalfa hay, 70 per cent; of the fine feeds, the average will be much higher. The gluten, brewery and distillery products will average 85 per cent of digestible; wheat refuse products, 77 per cent; and linseed and cottonseed meal, 87 per cent. Inasmuch

as the finer feeds constitute a smaller proportion of the ration the average would not be found to be above 80 per cent. Hence, we have then to provide this 2½ pounds of total protein in our rations, which is equivalent to .4 of a pound of nitrogen in the daily feed of a full grown dairy cow. In reference to the other elements of fertility, the question of amount is not so important, as we shall see later, because if we are able to secure the necessary protein the feeds are quite sufficiently supplied with the others to furnish the needed elements under average conditions.

Further experiments have shown that in the making of milk, from 17 to 25 per cent of the total amount of protein in the ration fed, is found in the milk produced or in the flesh of your animals. Hence, we have as a refuse product in the manufacture of milk and of meat at least 75 per cent of the nitrogen originally contained in the ration, .3 of a pound per day, or 110 pounds per year, and since it has been shown that solubility of the nitrogen is in proportion to the digestibility of the protein, that is, all digested nitrogen is found in the manure in the liquid or soluble form, it makes it imperative if we are to obtain the largest return from the total nitrogen in the manure made, that they be so cared for as to prevent losses of the soluble constituents.

It has been shown by investigations at a number of Experiment Stations, that when manures are exposed during warm weather that at least one-half of the nitrogen and potash contained in them will be carried away in the water that passes through, and furthermore that the nitrogen which has passed through is much more valuable than that which remains behind. In experiments to test this point, that have been conducted at the New Jersey Station for the past ten years, and including grain and hay crops, it was shown that the availibility of the nitrogen contained in the total excrement, the solid and liquid combined, was 62 per cent; using nitrate as the basis of comparison, whereas the availability of the nitrogen in the manure, which has been allowed to lie in the open air, and exposed to the rains that fell for half the year or less, the availibility of the nitrogen was but 41 per cent. In other words, in addition to the losses that may occur by the direct removal of the nitrogen from the manure, there is a further loss of 50 per cent in the availibility of the nitrogen remain-

ing. Using as a basis for the calculation the figures already obtained, as the amount of nitrogen in the manure of a cow, we find the total for a year to be 110 pounds, which, if 62 per cent available, would be sufficient to provide nitrogen for nearly two tons of wheat, barley, oats or corn, and three tons of timothy hay. If allowed to leach, we have but 55 pounds, which, with an availibility of 41 per cent, leaves but 22.5 pounds, or but enough to provide for one ton of timothy hay, and less than two-thirds of a ton each of the grains. These principles, applied to the vast amount of manure made in the country, show how possible it is for us to unwittingly permit a very great loss of very available materials, not only, but to reduce the effectiveness of the manures that are saved.

The practical questions then, are how shall the farmer manage, in order that he may, in the first place, increase the usefulness of his ration, and, in the second place, increase rather than diminish the fertility of his soil, particularly in reference to the question of nitrogen. It is possible to increase the value of the ration by two methods, first, the purchase of fine feeds, or the exchange of home-grown products for them, which will result in adding to the supply of protein; and second, by growing those crops which enable him to build up his ration in these elements, without recourse to purchased feeds. In the first instance, it would seem a most desirable practice to exchange, as far as may be practicable,—which must be determined by the prices of both classes of products,—those feeds which are not rich in protein for those by-products, like wheat bran and middlings, dried brewers' grains, malt sprouts, gluten feed, linseed meal, etc., which add to the content of protein, and increase the rate of digestibility. One very important point in this connection, is, too, that as a rule, these concentrated fine feeds are sold on the basis of food values alone, and without regard to their fertility value, whereas in most of them the fertility value is a very important consideration, and in a few nearly equal to their food value. In the case of wheat bran, for example, if the Eastern farmer paid ruling prices for the fertility constitutents contained in it, the cost without regard to food value would be $12, and, on the same basis, linseed meal would cost $21. That is, the farmer who buys these products on the basis of their food value, and brings them to the farm, brings valuable fertility elements, also, and

for which no charge is made, but which would cost the sums mentioned, if he bought them as fertilizers, and which, as has already been pointed out, has so important a bearing upon the subject of soil improvements.

The Chairman: You mean to state that the farmer could afford to pay $12 a ton for wheat bran and $21 a ton for oil meal as a fertilizer, measured by the cost of fertilizers in the market?

Prof. Voorhees: Yes, in the East he can afford to pay those prices without regard to the feed value.

The Chairman: You mean that he would have to pay that price, $12 a ton, for the same amount of fertilizer if he bought it in the fertilizer market?

Prof. Voorhees: Yes, and the chances are that he would get better fertility in the bran.

The Chairman: Men won't see it that way; that when they buy these products they are buying something to go back on the land, which, if they bought it in the fertilizer market, would cost them so many dollars a ton.

Prof. Voorhees: Yes, that is, farmers who buy these products on the basis of their feeding value and bring those products to their farms, bring elements of fertility also for which no charge is made, but which would cost them the sum mentioned if they brought them as fertilizers.

In many instances, farmers have an excess of corn, or of barley, or of oats; that is, if he uses them exclusively, he will waste a portion of his carbohydrates. If he sells these, and purchases the others, which will reduce this waste not only, but increase his milk flow, the exchange always results in giving him an advantage in the way of fertility. For example, a ton of corn meal would contain fertility that would cost, if purchased, $5.50, oats, $8.00, and barley $6.00. By exchanging these feeds for bran or linseed meal, therefore, there would be, on the money basis, and which we must regard it in the East, a very considerable addition to the fertility of the soil, and, in my judgment, it would be a wise method for the Western farmers to practice, at least in part.

Stated concisely, the principles involved are as follows:

1. Home-grown products are, as a rule, rich in carbohydrates and poor in protein and fat.

2. By-product feeds are, as a rule, rich in protein and fat, and poor in carbohydrates.

3. Feeds rich in protein contain more nitrogen, and, as a rule, more phosphoric acid and potash than whole grains or hays.

4. The results of the exchange of home-grown foods for by-product feeds are:

a. A more rational feeding of animals, because of a more economical use of nutrients.

b. A gain on the farm of fertility.

For example, the sale of 4 tons of timothy hay, at $16 per ton, 3 tons of oats, at $30, and 3 tons of corn, at $20, would bring $214.

The purchase of 4 tons of wheat bran at $20 per ton, 4 tons of dried brewers' grains, at $19, and 2 tons of cotton-seed meal, at $29, would cost $214.

The exchange of home grown products for the purchased products would result in a gain to the farm of:—

Food Nutrients:	Digestible protein	2,470.0 lbs.
	Digestible fat	456.0 lbs.
	Digestible carbohydrates	3,496.0 lbs.
Plant Nutrients:	Nitrogen	441.2 lbs.
	Phosphoric acid	295.2 lbs.
	Potash	37.6 lbs.

The protein gained is equivalent to nearly twice that sold in the 10 tons of home-grown products, or enough to provide the entire amount of protein needed for a herd of 40 cows for one month, and fertility constituents equivalent to those contained in 2,757 pounds of nitrate of soda, 2,108 pounds of 14 per cent superphosphate, and to 75 pounds of muriate of potash, fertilizer supplies that are expensive, but which farmers on exhausted soils have to buy.

This gain of digestible food would enable a larger production of milk, and at a reduced cost, or profitably increase the dairy products and provide a material increase in the fertility elements, which would cost, if bought in the open market in the East, $85, and I belivev that, in the long run, these fertility elements, if properly cared for, would be quite as useful in maintaining and increasing fertility as if bought in the

more concentrated forms. Many of you, I know, are following this practice, or it would not have been possible for you to develop your dairy industry as rapidly as you have. There are others, as everywhere, who may regard these figures as theoretical, and only of service in enabling a public speaker to provide himself with something to say. I wish to state, however, that this is an entirely practicable matter; that is, it is purely a business proposition, and means dollars and cents to a man who takes advantage of the situation, for not only have such results in reference to the influence of proper preparation of rations upon nutritive values and fertility been demonstrated in experiments, but in actual practice. Many Experiment Stations have been studying this problem, and they are a unit in recommending the improvement of the ration by the addition of more highly concentrated nitrogenous feeds than it is possible to secure under average farm practice.

In an experiment conducted at our own Station, with a wide series of rations, ranging in their nutritive ratio from one part of protein to four parts of carbohydrates and fat to 1:14, it was clearly shown that whenever the protein increased to the point which I have already pointed out as practically the best, 1:6 or 1:6.5, there was invariably an increase in the flow of milk, and a decrease in its cost per quart. For example, when the animals were changed from a ration containing a nutritive ratio of 1:6.5, to one showing a nutritive ratio of 1:14, made up wholly of home-grown products, there was a decrease in the milk flow of 33 per cent, or one-third. Now, while it is possible to secure an increase in milk flow without decreasing the cost per pound of milk, this was always accompanied by such a decrease. It has been possible by the use of this method in the East, when accompanied by a judicious seeding of other forage crops to provide all the roughage and part of the feed necesary to maintain at least one cow per acre per year, while at the same time to materially add to the fertility of the soil; that is, the soil's crop-producing power, instead of being reduced, has been increased in the course of ten years, by 40 per cent. This result, already hinted at as possible, has not been altogether accomplished by the purchase and use of the concentrated feeds alone, but rather by their use in connection with a larger cropping with leguminous plants, and this is the second method referred to, by which we

may constantly increase the fertility of our soil, while at the same time increasing the possibilities of keeping cattle on well balanced rations.

The Relation of Legumes to Fertility.

Farmers from time immemorial have known that crops differed in respect to the effect of their growth and removal from the soil upon fertility. They know that when they plant corn or wheat after clover, they get a better crop than if they plant the same chop on raw ground, or after a crop of grass. For a long time scientific men attempted to explain this phenomenon, by saying that the reason was that the clover crops were able, because of their root system, to gather large quantities of nitrogen and of the mineral elements from the lower layers of soil, and store them in their bulbous roots near the surface, and that this additional fertility was the cause of the increase in the following crop. This explanation, however, did not account for the fact that notwithstanding the larger crops that were grown because of the introduction of clover in the rotation, that soils, instead of becoming poorer in nitrogen, maintain their content, or even became richer in it, hence it was not until it was shown that the increased fertility was not the gathering of food from lower layers, and in storing it near the surface, but rather to the fact that the plants themselves were able to gather food not accessible to other plants. This point is of wonderful importance, and has a direct bearing upon the question of ration making and soil improvement. In the first place, because of the growing and use of these plants, rations may be made from home-grown products that will contain the proper proportions and amounts of protein; and in the second place, the soils became richer rather than poorer by the introduction of these crops, because of the power which they possess of gathering nitrogen from the air. Hence, the practical question arises: How far may farmers use these crops in their rations, or whether it is possible to make up rations, without the use of a large quantity of purchased feeds, which are richer in the protein substance than ordinary home grown product?

Experiments have been conducted along this line, which show very clearly that all the various leguminous plants,

alfalfa, as hay, possesses such characteristics as to enable it to very largely substitute such fine feeds as bran, middlings and linseed meal, that is, alfalfa, because of its palatability, because of its content of protein, and because of its proportion of digestible nutrients may be used to substitute in large part those feeds which possess the same general characteristics. Bran, middlings, linseed meal, cottonseed meal, gluten, alfalfa, and all of the other feeds that are recommended, are not recommended because they are bran, middlings, etc, but because they do contain these nutritive substances in such from as to satisfy the needs of the animal in respect to protein, and which are not always economically satisfied when only the ordinary farm feeds are used. Ground alfalfa has been shown to be more completely adapted to substitute bran than the hay, because a part of the work that the animals would have to do has been done by a machine; whether it will pay to grind the alfalfa depends upon the cost of grinding. Where the cost is such as to make the cost of the alfalfa meal no greater than the cost of bran, then it is a good form in which to purchase the material. The experiments referred to showed that it was possible to make up rations from alfalfa hay and silage alone, which would satisfy all the needs of the animals, and secure a flow of milk practically equal to that which was obtained when finer feeds were used, but because of the disproportionate amount of bulk it is not possible to make a ration of this sort quite as effective per unit of digestible matter as in the case of the feed rations. The experiments conducted at our Station with fine quality alfalfa hay, showed that 30 pounds of silage and 13 pounds of alfalfa hay produced within 4 per cent as much milk and butter as a ration made up of the same amount of silage and the following feeds:

Mixed hay .....5 pounds.
Wheat bran .....6 pounds
Dried brewers' grains .....5 pounds

Besides, the alfalfa hay ration reduced the cost of 100 pounds of milk from 83.9 cents to 55.9 cents, and the cost of a pound of butter from 16.7 cents to 11.1 cents, when the alfalfa hay was valued at $14 per ton, and regular prices paid for bran and dried brewers' grains, namely, $23. and $20. per ton, respectively. In other words, the feed ration increas-

ed the cost of milk and butter over the alfalfa ration by 50 per cent.

In another experiment, where the rations were made up of:

35 pounds silage,
11 alfalfa hay,
6 pounds mixed hay,
2 pounds cottonseed meal,

on the one hand, and:

35 pounds silage,
6 pounds mixed hay,
4 pounds wheat bran,
2 pounds dried brewers' grains,
2 pounds cottonseed meal.

the alfalfa hay ration produced within 4.5 per cent as much milk as the purchased feed ration, with a corresponding reduction in the cost of milk. These experiments are sufficient to show the practical usefulness of alfalfa as a substitute for fine feeds, in part at least.

In still another experiment, where the hay was not of so good a quality, it was shown that the amount of milk produced was much less than where the feeds were added, though the cost of milk and butter was very materially reduced. Experiments recently reported by the Pennsylvania Experiment Station, show that when it is assumed that alfalfa meal costs no mere than bran, namely, $20. per ton, the former seems to produce milk at the lower grain cost per hundred pounds, namely, 44 cents against 45.3 cents for bran; in comparison, if wheat bran is worth $20 per ton, alfalfa meal is worth $21.28 per ton, striking evidence of the practicability of the substitution of home-grown protein crops for the more expensive mill feeds. It has, also, been shown that hay from red clover, crimson clover, cow peas, soy beans and vetch, also possess the same characteristics, though not in the same degree, because they do not contain so high a content of digestible protein as the alfalfa, and their relative advantages are less, because these are annual or biennial crops, and not perennial, as is alfalfa.

With this point established, the next question is: Is it practicable to raise these crops, and thus make the farm in a way self-supporting, so far as the making of balanced rations

and maintaining fertility are concerned? I may say that in the East it has been abundantly demonstrated that all of these crops can be successfully grown, and many of them, as summer and fall catch crops which do not interfere with the regplar rotations of corn, potatoes, wheat and grass, thus adding to the possibilities of an acre of land for crop production, though alfalfa, because of the valuable characteristics which it possesses in being a permanent crop, is one of the most important on the whole. At our own Station, for example, it has been shown that a seeding of alfalfa made in 1898, is still cutting profitable crops, and that the average cost per ton of hay has been about $6.50, including the cost for labor, fertilizers, manures and all other expenses connected therewith. In my judgment, there is no one phase of the question under discussion which is so important, both in reference to the matter of feed and fertility, as the introduction and use of these various plants, because it enables the farmer to supply nearly all the needed demands in the way of protein, without extra cost, while at the same time helping to build up his soils in this most useful constituent, nitrogen. In one year on the New Jersey College Farm, there was harvested 7.5 tons of alfalfa hay per acre; each ton of hay contained, on the average, 330 pounds of protein, or a total for one year of 2476 pounds, sufficient to supply the total protein needed by 2.71 cows for one year, or each ton of this hay contained, on the average 52.8 pounds of nitrogen, or a total in the hay removed of 396 pounds of nitrogen. This nitrogen would cost, if purchased in organic forms, $67.32. If used in the dairy, and only 75 per cent. of the total retained in the manure, there would be 277 pounds, or sufficient to supply the needed nitrogen for nearly 10 tons of corn. It is assumed, of course, in this statement, that all of the nitrogen contained in the crop was derived from the air, and that this is a well based assumption in this case is proven by the fact that the soil upon which other crops of alfalfa had been grown, and which were afterward used for cereal crops, showed that the soil was certainly no poorer in fertility, and was better for some reason or other, and naturally to the added nitrogen and organic matter accumulated in the roots and stubble, than before the alfalfa was grown. This method, therefore, enables the farmer to provide the needed protein in his ration, by inexpressive methods, while

at the same time obtaining, without cost, a very large amount of nitrogen, not needed in order to grow this crop, but quite as suitable for the growth of corn, or other crops useful in making rations , as that which can be purchased in commercial forms.

I have emphasized more particularly the alfalfa crop than red clover, alsike clover, the vetches, etc., because it is the one above all others which will, if successfully grown, permit the carrying out of the principles pointed out, though I do not wish to be understood as saying that the alfalfa should be grown to the exclusion of the others. Red clover in its way, and because it can be generally grown, should be as largely cultivated as is possible, and will, though not in the same degree, assist both in increasing the possiblities of making home grown rations and in soil building. Neither do I desire to be understood as saying that alfalfa can be grown on all soils without other effort than proper seeding. The nitrogen derived from the air is not the only element of plant-food required; there must be in the soil, either originally or supplied, the other element of plant food, phosphoris acid, potash and lime.

The Chairman: You think, do you, Professor, that lime and potash are very important constituents in growing alfalfa?

Prof. Voorhees: Yes, particularly lime.

The Chairman: I would like to know how many men in this audience have ever applied lime to their soil?

Mr. Taylor: I have a limestone soil.

The Chairman: But have you ever applied lime? There are three men in this audience only that have ever considered the question of applying lime to their soil.

Prof. Emery: Did not the report of our Agricultural Station speak adversely of that some years ago?

The Chairman: I don't know about that. I know it assists of the growth of alfalfa wonderfully.

Prof. Voorhees: We find that to be so in our state, that lime is almost universally required if we expect to get a big crop of alfalfa.

Prof. Emery: Suppose we have limestone six to eight feet under our surface, is it necessary then?

Prof. Voorhees: Very often, because the center soil may be acid, and it is deficient in the form of lime you require.

Prof. Emery: Is clay soil apt to be deficient in lime?

Prof. Voorhees: Yes. Sandy soils,—clay soils are perhaps not deficient in the amount of lime required by the plant itself, but deficient in that it does not give the plant the proper physical character of soil. The lime opens it up and makes it less hard.

The absorption of nitrogen from the air is possible only in proportion as these are available, and in many instances failure to grow alfalfa is due to neglect in supplying these mineral forms of plant-food. The same is true of the other leguminous crops that may be grown here; the availability of the minerals measures the power of the plant to acquire nitrogen, other conditions being favorable. We should take advantage of all of these opportunities, if we are to reduce the cost of our dairy products, and at the same time prevent the loss of our fertility, for it must be remembered that, after all is said and done, the soil is the source of the Nation's wealth, and that we, as individuals, will get our share just in proportion as we understand the laws of Nature, and direct them in our practice. These laws are immutable, and apply to all, the rich as well as the poor; the learned as well as the unlearned; the farmer as well as the manufacturer—all are subject to the law.

DISCUSSION.

The Chairman: Now, I want you to show that a Wisconsin audience has brains enough to ask a New Jersey Professor some questions.

A Member: Have you ever tried cow peas as a fertilizer?

Prof. Voorhees: Yes, we are using them very largely in our state and with very excellent results. If you are sure that you have phosphoric acid and potash you can sow cow peas on very light soils; on practically barren soils you can put 200 pounds of phosphoric acid and 200 pounds of potash and sow a crop of peas about the first of June and ordinarily get a very good crop.

Prof. Emery: What about the soil for your alfalfa?

Prof. Voorhees: Our recommendation is to try to raise alfalfa only on ground that will grow potatoes and corn. If we can we put in a crop of cow peas or soy beans the year before in order to procure the humus, or if we have an abundance of manure that we are quite sure is free from weed seed, we plow that in the year before or in the spring, then cultivate it during the spring and precede with a crop of oats and peas. That is an excellent crop to precede alfalfa. We remove them about the first of July, we do not plow it again, simply cultivate and seed with alfalfa in the latter part of August. That has given us the best results of any method we have tried.

The Chairman: Now, you are in a different climate, Professor, so that you can get your alfalfa to grow large enough so it will go through the winter. We find it dangerous in this climate to seed as late as that. It is hard to get alfalfa to make sufficient growth to go through the winter after that.

Prof. Voorhees: We can get sometimes a foot—knee high. by sowing in August. We don't like the spring seeding so well, because we frequently have an early drought. After the alfalfa is seeded in April, we get a drought in June and it will continue long enough to practically destroy the plants—although many of our best alfalfa patches were seeded in the spring.

Prof. Moore: In Wisconsin we have carried on experiments during nine years and invariably we have found the early spring seeding to be the best. We have seeded all through the summer, practically every month, and I have not as yet been able tc carry a crop through that was seeded later than the fourth of July, although it looked exceptionally fine in the fall.

Prof. Emery: How early is the best seeding time?

Prof. Moore: When you sow barley, from April 15th to April 30th, according to the season. In the Southern part of the state you sow barley as early as the ground will work well, when it is in good tilth.

Prof. Emery: That is, barley is sown with the alfalfa, you mean. What is the object of sowing barley with it?

Prof. Moore: Most of the lands of Wisconsin are inclined to be weedy, on account of the high fertility, and the Experi-

ment Association that is carrying on several hundred tests, found it was profitable to sow with a light nurse crop, not thinking that the nurse crop would help, except to keep down weeds. If they had land that was free from weeds, it would be an advantage to seed the alfalfa alone, but most of our land is quite weedy and consequently we put in that nurse crop. Three pecks of barley are sufficient and the barley can be left to ripen. If you sow oats, I think it would be well to cut the oats for hay, we cut the oats usually when they are headed.

Mr. Hill: I want to ask the Professor a question that perhaps will appear to be too technical for this audience, but sometime it is going to be important, I am sure. You remember that in his figures he said that the fertiltiy in a ton of bran was worth $12 and in a ton of feeds with higher protein contents, such as oil meal, it was worth $21. Now, isn't it true, Professor, that we are going to be able to supply our lands with protein through clover and alfalfa and that bran, in proportion to the other, is worth more on account of being particularly high in phosphoric acid and potash in proportion to alfalfa?

Prof. Voorhees: Yes. Bran is rich in phosphoric acid and potash. While we place a value on those constituents and we need these, we have to buy them in our very light soils, in the East, but in your state where you have such an abundance of minerals as you have here, it seems to me that you can draw on those for a very long time, without danger of coming to the end of them. Now, your added nitrogen is not the only advantage you get in your alfalfa. You get a mechanical advantage, it improves your soil and enables the plants to get at the phosphoric acid and potash. It seems to me that so long as we can get such large crops of alfalfa and other leguminous plants which take out this potash and phosphate, that it is wise farming and I would not buy bran to do the same thing.

Mr. Goodrich: Doesn't alfalfa improve the mechanical condition of the soil?

Prof. Voorhees: Certainly, all these crops do. We had a crop of alfalfa growing and it was a new thing in the neighborhood and farmers came to see it, intelligent, educated men, all sorts of men came to look at this alfalfa, and I was look-

ing at it every fifteen minutes when I was home and was delighted to see it was making such grand growth. It was green, it looked so rich, you couldn't help but smile when you looked at it. A man came out there one day and he says, "That is a big crop, but I would be scared for that kind of a crop, it must be hard on the land." I said, "What in Sam Hill are we growing crops for? We are just trying to get them to take up the phosphoric acid and potash that goes back in the manure.

Prof. Emery: Then we have got to learn to feed, not only our animals, but our soils.

Prof. Voorhees: That is right. We have got to learn to feed our soils, not only in enabling the plant to get the thing in the soil that it wants, but to produce things that the plants want and you haven't got. You can buy those things very much cheaper than you can nitrogen. In the East we pay $4.50 for phosphoric acid, $4.50 for potash and the farmer pays from $15 to $30 a ton for nitrogen. The phosphoric acid and potash remain in his soil until the plant takes them out, and the nitrogen, you don't know whether you are going to get it out or not, so that the nitrogen question is far away above all other questions, so far as fertility is concerned.

Secy. Burchard: Some are beginning to think in Wisconsin, especially in the dairy sections of our state, that we do not need to buy any nitrogen; that by growing these leguminous crops for our cows, we can get our nitrogen in the cheapest way possible from Dame Nature, from the atmosphere.

Prof. Voorhees: I think you are dead right.

Mr. Fargo: How many times do you cut alfalfa during the season? And what is the best way of curing it?

Prof. Voorhees: Well, we cut, I suppose, on an average about three times, although we have cut four and five. Let me finish answering this other question. In making alfalfa hay we cut it in the morning, if it is a dry, clear day, and rake it up in the afternoon, or if the weather isn't as clear as we like, we cut it in the morning, let it remain there, and put it up in windrows, stack it up.

Mr. Fargo: Do you use hay caps?

Prof. Voorhees: We do to some extent and find them very desirable.

Mr. Fargo: And how long do you leave it lie?

Prof. Voorhees: That depends entirely on the weather. We can put it up in small cocks the same day. In bright, dry weather it is possible to do it, and then open it up the next day.

Mr. Howe: When should the lime be applied to the alfalfa field?

Prof. Voorhees: The lime should be spread broadcast previous to seeding. You plow your land in the spring. as soon as it is plowed I would apply the lime. Then when you cultivate and harrow it, get it in shape, you get that thoroughly mixed with the soil.

The Chairman: Did you ever use air slaked lime?

Prof. Voorhees: We have both kinds, but we prefer to buy the burned lime and slake it ourselves.

The Chairman: With water?

Prof. Voorhees: Yes.

The Chairman: That is what you call hydrated lime?

Prof. Voorhees: Yes. You take ground burned lime and it is better, but it is more costly. The cheapest lime with us is the ordinary unburned lime, because you get more lime to the bushel.

A Member: Why do you take the trouble to slake it?

Prof. Voorhees: Because it is in lumps and it can't be applied evenly.

A Member: How much do you use to the acre?

Prof. Voorhees: About twenty bushels on heavy clay, and from that up to fifty.

Mr. Glover: What objection would there be to adding your slaked lime to the manure?

Prof. Voorhees: The slaked lime would set free your ammonia. If your lime has been burned, it has a caustic effect upon organic matter and you will lose that nitrogen. Carbonate of lime, ground limestone, will not hurt your manure pile; in fact, it will help it. Your burned lime, unslaked and slaked, are both caustic if you apply them to your manure, and there is great loss of nitrogen.

Prof. Moore: At the Experiment Station we put on from twenty to thirty bushels of lime. We slake it everywhere else, except where we put on our oats. The soil has been analyzed and it has been found that there is abundance of lime in the soil, and consequently we did not receive any beneficial ef-

fects, we did not see where it was helpful at all. We applied it in connection with alfalfa and also with sugar beets.

Sec'y Burchard: Would you apply the lime on the surface of the alfalfa field where the alfalfa is now growing?

Prof. Voorhees: Yes, I would if I had not applied it before; no harm would come to the alfalfa, and in fact, if you get your alfalfa seeded well, so that it will continue I would advocate the application, say, of twenty bushels of lime, every four years on the surface.

Prof. Moore: Isn't there some way by which the average farmer could determine readily whether or not his land needed lime?

Prof. Voorhees: I think so. It seems to me if you had abundance of lime present, you could get a reaction with acid.

The Chairman: Could you use litmus paper?

Prof. Voorhees: It would hardly be sufficient, I think. It would not determine whether you had it within that soil or not.

Sec'y Burchard: But it would determine whether the land was sour?

Prof. Voorhees: It might be done if you had a small particle of lime in your soil, and would get an effervesence.

The Chairman: I have known men who have been bothered raising clover who have taken a small piece of ground and put on lime and they succeeded better. Alfalfa seems to be governed by the same law.

A member: How do you sow alfalfa?

Prof. Voorhees: Shallow, as a rule. I prefer to have Prof. Moore answer that question for Wisconsin.

Prof. Moore: We sow alfalfa with a seed attachment to the grain drill or with the seeder we are using for the corn crop, or sow by hand, then we cover quite shallow, running a slant tooth harrow over once. Alfalfa seed and the corn crop can be sown by the one operation.

The Chairman: I buy every year all the wood ashes that Fort Atkinson can let me have and pay ten cents a bushel for them to put on my alfalfa sod. I buy about five or six hundred bushels a year. That simply gives a combination of potash and lime and it is the finest thing I can get hold of. We have not yet in Wisconsin confronted squarely these questions of fertility, you know we have been with our back turned to that

question. Now, these Eastern farmers, after having gone through this experience of seeing all their farms go down, they have had to face it and face it squarely, and think of it, gentlemen, we are paying the United States over fifty millions a year for commercial fertilizers.

Speaking of phosphates, I got a carload from Tennessee last fall of ground phosphate rock. It cost me about $10.50 a ton in 100-pound bags. I stacked it up in my shed. I had more than I needed myself, and bought it with the hope that some of my neighbors would want to take it with me. But, no, they don't want it, and I don't know as they would pay 50 cents for a dollar bill, I doubt it very much. But I keep pounding at them and I hope for better things all the time.

Recess to 1:30.

The Convention met at 1:30 P. M., February 21, 1907. Mr. H C. Taylor in the chair.

INTENSIVE DAIRY FARMING.

H. D. Griswold, West Salem, Wis.

Mr. Chairman, Ladies and Gentlemen: What does "Intensive Farming" mean? It means more profitable farming, as I understand it. It means business methods applied to farming and to dairying.

Now, you have heard these dairy questions discussed, and I don't know that I can tell you anything new, but I can simply tell you that I have applied some of these methods that have been advocated for years and I have been fairly successful.

In the first place, to start a profitable dairy, you must have a good dairy sire. I have had a full blood dairy sire at the head of my herd for sixteen or seventeen years. I have weighed the milk and tested it from each cow for nearly that whole time. I know today what every cow in my barn has done last year and the year before and every year of her life.

When I got the full blood sire, I had a mixed bunch of cows probably like too many of yours. Some were good cows and some were poor cows and I didn't know which was which without I weighed the milk and tested it, then I could pick out the poor ones.

If you get a full blood sire into your herd, you want to keep the heifer calves, of course, and if you have a cow that does not pay, and you are going to keep the heifer calves, you are not likely to keep the heifer calves from the cows that don't pay; it is more likely that you will sell those heifer calves, because you don't want them, you want to get rid of them the first thing, the longer you keep them the worse you are off.

Now, I saved all of my heifer calves for a good many years; I didn't sell any of them. I kept picking out the best from time to time and every year I picked out the best and kept them for myself, and got rid of the poorer ones, and every year I could see a little improvement. You mustn't expect too much on the start, because if you have a poor lot of cows, you must not expect to get a first class lot of cows with the first cross. You may get some good ones, but you can't get rid of all of the poor blood by one cross.

Another thing I did was to pick up from time to time anything that I could buy that I thought was better than what I had, usually a heifer calf. Sometimes a man in town has a very nice family cow, and perhaps he doesn't want the calf and you can get it at a reasonable price; if you think it is better than what you have, buy it, and you have something good to cross up on.

Now, as to the full blood sire, I know a good many hesitate and say, "I can't buy one, they cost too much." Now, the cost of keeping isn't any more, the care isn't any more, all that costs more is that first cost, and after you have bought one you can usually make an exchange with somebody for another one when you want to change, or you can sell it and get your money back and buy another, and in the long run you are not much out. Or if he has a small herd, perhaps a man can buy one in company with his neighbor,—if they can agree, and the same one will answer for the two; that is done many times.

There are a great many things in the dairy business, little things that come up from day to day that you can't tell a man about. A man has got to have some judgment and some sense

of his own. He ought to know when a cow needs taking care of and he ought to have sense to know somewhere near what she wants done for her. He ought to have sense enough to keep her in when it is cold, and to keep her where it is warm, and he ought to have sense enough to feed her the right kind of feed.

Now, as to feed for a dairy cow—take a calf from the time that it is born, I like to feed it good all the time. A calf raised at the strawstack doesn't amount to much, it wants good feed all the way through, and my experience has been that I never have been able to feed a cow very well, or do much with her, that was brought up without good feed for the first two years.

I feed a little calf some food just as soon as it is old enough to take it, and I keep them growing, not fattening food, not corn meal, but I feed them such feeds as bran and oats, a little bit of oil meal, a little ensilage, a little clover hay, and you will be surprised how soon they will eat it. We feed them new milk at first, the first two or three weeks and then gradually work off into skim milk, putting a little skim milk with the new milk, and then some more until finally we feed all skim milk and keep that up until they are six or eight months old, about six pounds at a feed, and if they are hungry, they get to eating something else so much the quicker.

Then we feed our yearlings each of them a little ground feed every day, and we always tie them so that each one gets its own feed, never bunch them up in the stall so the big ones get all they want and the little ones what they can. We always feed them so that each one gets his share of the feed.

Then we keep account of every cow's milk by having a scale and weighing the milk and setting it down every milking. We keep account of everything. We know when the cow is due to come in, and so we allow time enough for her to go dry, say, about five weeks. We think that is long enough, we don't want to go without the milk any longer than we have to, but we want to have her have a little rest and we think about five weeks is long enough and we take that time to dry her up and do it gradually, and at the same time we take away all the heavy feed and give her a little light feed. We don't want her to lay on any flesh while she is dry, that is, any fat.

Then when she comes in, she is in good shape. When she

has her calf, we see that she has a good warm place, well bedded and dry, and soon after the calf is born we give her a pail of warm water, milk her out partly and then leave the calf with her and let her alone as much as we can. We don't stay around there and keep her disturbed, but we leave her alone, she will take care of herself. We don't give her a big mess of feed right away, but we come up very gradually on that feed, and in three or four days, if she is well and healthy and has a good appetite, we will have her up to about full feed.

We haven't had a case of milk fever in six or eight years. I know you can cure milk fever in these days, but I think it is better for you not to have milk fever in your herd. We have our stable warm and it is light and we keep the cows in in cold weather. There are windows on each side, the stable is whitewashed and it is ventilated by the King system so that there is no smell in the stable. The floors are cement and the mangers are cement. We water the cows in the manger and we don't have to turn them out. We sweep the manger out every day; let in water at one end, it runs along the whole length and each cow drinks as it reaches her and there is an outlet at the other end to let the water out, what is left. The tanks are in the stable, the water is forced in with a windmill and with a hose we can run the water into the manger and water them right there. My cattle have not been out of the stable since last September. I have a cow in there thirteen years old that has never been out a winter in her life. If you turn a cow out in cold weather, what does she do? She simply goes out and she finds the warmest place in the yard and she waits there until she can get back in the stable. She doesn't go off and walk a mile for exercise, and if the water is cold, she drinks a little and then she begins to go this way (shivering) and she doesn't drink nearly the amount she would if she was warm and the water was warm. In the stable, she drinks her fill and lies down; she is contented, because it is warm. Another thing, if you turn her out in cold weather, the stable grows cold pretty fast; you take a day like today, for instance, the stable grows cold, the cow comes in after having drunk some cold water, and that makes her colder yet, and when she comes back in the stable, it takes a long time before she is as warm as she was before, while if she stays there she is warm all the time.

I haven't got any expensive stable. I built it with my own hands, I made the cement floor with my own hands. It is simply double boarded with paper between, and anybody can do it.

Now, we feed our cows what we think they need; we do not feed any two cows just alike, hardly, but we study every individual cow and give her what she likes best and what we think she needs and all that she will take to advantage. The owner studies every cow in the barn, he knows when she came in, and he knows when she is due to come in again. He feeds her according to his judgment; he watches her milk sheet and there is the weight of the milk set down, and if there is a falling off there he sees it immediately and wants to know what the trouble is. If you are not keeping any account of yonr cow she may fall off half a pound a day and you won't notice it, but you will wake up some day to the fact that your cow is half dry; but with that milk sheet, if you are attending to your business you will notice it right away and will see that "Mary" is off today or "Pet" is off today. What is the matter? Maybe you will change your feed a little and watch the result, give her something different, or perhaps there is something the matter with her, maybe she needs a little physic or something to start her up. So you see that milk sheet gives you a chance to watch every cow and see what she is doing. Now, you say, "That is lots of bother to stop your work for that, I could not do that." I say, "You couldn't do anything else that would pay you any better."

I got one of my neighbors to take Hoard's Dairyman one year, and I asked him the next year if he was going to take it again, and he says, "No, the fact is I have so much to do I don't have time to read it." Now, what did he do that paid him better than to have read that? This neighbor lost three cows with milk fever and the fourth one came down with milk fever, and he said, "I have got another cow down with milk fever.' I said, "Well, haven't you tried the air treatment?" "No, I don't know anything about the air treatment." "Well, if you had spent that dollar for Hoard's Dairyman you might have known that and saved all those cows." He did use it for that last one and saved her and he might as well have saved the others.

Now, I have been working on these lines, keeping a full

blood sire, keeping the record of every cow, watching for her comfort, seeing that she has what she wants to eat and all she wants to eat all the year through.

You know in the summer time that a pasture often gets short and you don't like to feed very well. You have lots to do and you let them run along, although you can see they are falling off a little on the milk, but they are getting their living out of that pasture, and that is easier for you than it is to feed them, and it won't make very much difference—maybe it will rain and the pasture will start up again, and the first thing you know your cows are half dried up. When a cow drops off you never can bring her back till she comes in again; the tendency of that cow is to drop off all the time, and you have got to do your best to keep her up. So when the pasture begins to drop off and your milk sheet shows that the milk is dropping off, then you should supplement with something. I have been feeding ensilage the last few years in the summer time and I find that ensilage, with grass, is very satisfactory. Before that I fed ground feed that I had to buy. Now I can feed ensilage and that I can raise, so I get along lots cheaper that way.

Now, you see those figures on the board over there. I got my first full blood sire in 1889, but you see it takes two years before you get some heifers and you can't expect a great deal of those heifers the first year or so, so it takes quite a little while to get a good start.

In 1891, I had eight cows and they brought me $388. In 1893, I had ten cows, and they brought me $609. In 1897, I had fifteen, and they brought me $798. You must bear in mind that all this time I was carrying quite a number of heifers and those were always counted the same as full cows, though, as I say, a large majority were heifers with their first calves. In 1900, eighteen cows brought me $1,147. In 1901, I built a silo; before that I had not had any, and you will see that after using that silo two years I was keeping twenty-three cows and had practically doubled the amount of money received in three years, $2,243 it comes to.

Mr. Hill told you yesterday about the value of the silo; that speaks for itself.

In 1906, last year, I received $2,091. Now, you will say, "You haven't made any gain, you have rather fallen off in

the last three years." Well, we have had some trouble in the last three years. You know that things never run along just so smoothly for any great length of time and there has been trouble in herds all over the country with abortion. When that first appeared in my herd, I must confess I was discouraged because my neighbors told me I would lose one-half my herd, but we did the best we could and you see we didn't lose one-half, we held our own pretty well and we think now that we are about through with it, we hope so, anyway. So that if these things come, don't think that you must throw up the business and quit. Stick to it, because others have to stick to it and make a success in spite of it, and they do it, too.

So that, in the last five years, with an average of about twenty-five cows, I have averaged over $2,000 a year for my cream money; that is, I have taken in over $10,000 in five years for my cream.

Yesterday I heard quite a little talk about dairy calves. It was said that they weren't good for anything. When I commenced I gave away some calves; then as they graded up and got better I didn't have to give them away, I got something for them and I kept getting more for them. When you have something that is good, there is always somebody that is willing to buy them, and today my calves are spoken for a year in advance. I can't supply the demand.

In 1891, for the increase of my herd I got about $50 in the year. Last year, I had over $1,000 for the increase of my herd besides the cream money. There is now a strong demand for good grades and just before I left home I sold two grade cows to go out to South Dakota at $125 apiece.

DISCUSSION.

The Chairman: Fellow dairymen, this subject comes closer to you and me than any other subject we have had. This gentleman has not a large farm, he chose to pursue dairying in a very close and intensive way.

I want you to note, first, that he told you he selected a sire to place at the head of his herd from one of the dairy breeds; that is the first step. Second, he continued to keep the cows

he had already, and so far he has done nothing more than any dairyman in this state can do. Third, he went and moused about for good cows and splendid heifer calves and put them on his farm and took good care of them from the time he got them until they became cows.

Now, you will see all the way through here that he rendered unto these cows, not only what he knew ought to be rendered, but he tried to perform all his duty by them just when it was needed to be performed; he did not wait for the next day —he did it at that one time; he kept his heifer calves, increased his herd from year to year, both in numbers and in productiveness. Besides that, he kept his cows in a good barn with a cement floor, mangers cleaned every day, just the same as you have your own kitchens cleaned up every day. He watered them there, bedded them, they made their whole toilet in the barn; he did not turn them out from fall to spring.

He fed the cow that was about to freshen lightly after she was dry until she became fresh again, then he gave her a light ration which was gradually increased until she came to her full flow of milk. Is there anything in that that we cannot any of us do? Is there a man here that does by his cow as well as he knows how to do?

Now, the subject is yours and I venture to say the gentleman will answer any question you put to him, because he knows what he is talking about.

A Member: What breed did you have?

Mr. Griswold: Guernseys.

Mr. Goodrich: How many acres of land have you?

Mr. Griswold: Sixty acres.

Mr. Goodrich: You spoke of feeding silage to calves. Did they get that while they were on milk?

Mr. Griswold: Yes, I give them a little handful when they are not more than two weeks old.

Mr. Goodrich: Do you feed ground feed while the cow is dry?

Mr. Griswold: Yes, I feed bran or oats or something like that, but never corn meal.

Ex-Gov. Hoard: That is for sustaining the coming calf.

Mr. Griswold:,Yes, some protein feed, but not a fattening feed.

A Member:,How much grain do you feed after she is thoroughly dry?

Mr. Griswold: Not more than two or three pounds a day. Of course, if it is a strictly dairy type of cow she won't lay on flesh any way, and you can give her a little more, but if she is inclined to freshen up I keep her pretty short.

Mr. Aderhold: I hear dairymen frequently make the remark that they save their heifer cows from their best cows, and I happen to know that they never weigh or test the milk from any cow in their herd. Do you think that they know which are their best cows?

Mr. Griswold: No, sir; they think they know, but many a man gets fooled in this way, because a certain cow will come in and give a big mess of milk and you think she is the best cow you have and maybe after six months she is practically dry while another cow gives a small mess, but she will give nearly the same amount for eleven months and she will figure up in the long run a good deal more than the other one did.

A Member: Do you raise all you feed on sixty acres for twenty-four cows?

Mr. Griswold: No, sir; I buy some of the feeds that I use. I sell some of my corn and oats and then I buy something else to go with what I have left. We are using dried brewers' grains and a little screenings.

Mr. Goodrich: Do you pasture in the summer time?

Mr. Griswold: Yes. I have hardly pasture enough and I rent a small pasture in the summer time.

Mr. Goodrich: What do you pay for this brewers grain by the ton?

Mr. Griswold: It is a little less than bran usually, and it has a larger per cent of protein than bran.

A Member: At about what age do you have your heifers drop their first calf?

Mr. Griswold: Two years old.

A Member: What do you do for abortion?

Mr. Griswold: We think one of the best things to do is to secure cleanliness. We have fed carbolic acid to the cows.

The Chairman: Absolutely thorough cleaning up after it is in the herd is very important, with the use of disinfectants.

Ex-Gov. Hoard: Do you whitewash your stables?

Mr. Griswold: Yes, I try to do it every year.

Ex-Gov. Hoard: And do you isolate those cows that go wrong?

Mr Griswold: We can't very well, we have only one stable so we disinfect thoroughly. If I had another stable, I would certainly put them away.

A Member: Do you disinfect the whole herd or simple the cow that is infected?

Mr. Griswold: We disinfect the one cow and the two cows each way from her and the stall, and wood work or anything that is bare.

Ex-Gov. Hoard: Do you think that a man can produce first class grade cows from a grade sire with any degree of certainty?

Mr. Griswold: No, I don't think so. I would not recommend a grade sire.

Ex-Gov. Hoard: But a very large proportion of the farmers of Wisconsin do not believe that it is important to use a registered sire. You have been through this, had considerable experience, and I want to know how you feel; if it would be profitable to you?

Mr. Griswold: I would not use a grade sire under any considerations. But I have sold my grades for breeding purposes, because there are men who are bound to have a grade. They will not buy a full blood anyway, and sometimes after they have used a grade two or three years they will come and buy a full blood when they would not have bought one to start with.

Ex-Gov. Hoard: They have to take it gently.

Mr. Girswold: There are some men, you know, that you have to handle that way.

Ex-Gov. Hoard: What do you do with the male calves?

Mr. Griswold: The first part of the time I gave them away to anybody to get rid of them, but for the past few years they are spoken for a year in advance. I usually get ten or twelve dollars apiece for them.

Ex-Gov. Hoard: Do you inbreed any?

Mr. Griswold: No, I don't. I have tried it, but I never have got anything good.

Prof. Emery: Would you use a sire on his granddaughters?

Mr. Griswold: I don't know that I have tried that.

A Member: Do you have your cows fresh in the fall or in the spring?

Mr. Griswold: Part in the fall and part in the spring.

The Member: What is the advantage of dividing it up?

Mr. Griswold: I would rather have nearer an even flow through the year, or perhaps more in the winter, but I find that it is a harder thing to get cows to come in in the fall than in the spring.

Ex-Gov. Hoard: Is it so when you start with the heifer first?

Mr. Griswold: It seems to be a more natural thing for them to come in in the spring.

A Member: What does your milk test?

Mr. Griswold: About five per cent butter fat.

Secy. Burchard: What is your market?

Mr. Griswold: I ship cream to La Crosse mostly, but this year I wouldn't hardly get any margin above the creamery.

A Member: How many pounds of butter ought a cow to make each year?

Mr. Griswold: This last year five cows made over 500 pounds of butter each, and eighteen cows made over 200 pounds of butter each, and if a cow won't make 300 pounds under ordinary conditions, then I don't want her at all.

The Chairman: "Go thou and do likewise." We will have to cut this off.

THE PATRON'S RESPONSIBILITY FOR THE QUALITY OF FACTORY PRODUCTS.

J. Q. Emery, Dairy and Food Commissioner, Madison.

By factory products, I understand butter and cheese to be meant.

The score card for cheese recognizes the following qualities: Flavor, texture, color, finish. In a total of 100 for a perfect product, flavor is given 45; texture, 30; color, 15; finish, 10.

The score card for butter recognizes the following qualities: flavor, grain, color, salt, packing. In a total of 100 for a

perfect product, flavor is given 45; grain, 25; color, 15; salt, 10; packing, 5.

It is to be observed that in both butter and cheese, flavor is by far the most conspicuous quality and when perfect receives 45 out of a total of 100 points. The flavor, therefore, of the factory product more than any other one quality and almost equaling all other qualities combined, determines the market price. In cheese, those conditions of milk that impart to it flavor, affect aiso its texture. For the flavor of butter or cheese, the patron is chiefly responsible. I do not say wholly responsible, but cheifly. If the patron delivers milk or cream of poor or bad flavor, it is absolutely fatal to a perfect or high class product.

The standard dictionary defines flavor as follows: The quality, especially a specific or delicate quality, of a thing as affecting the sense of taste or the senses of taste and smell; rarely, a quality affecting smell alone; the peculiar taste of a thing, especially if it be pleasant.

The presence or absence of this delicate quality in butter and cheese, determines more than anything else the market price of those products. Unless this quality is present in the milk or cream furnished by the patron, the maker can no more produce a product of high quality than could the Isrealites produce bricks without straw for their Egyptian task makers. If the patron destroys that delicate quality in his milk or cream, like the passing moment, it is gone, never to return.

This leads to a brief consideration of the source of those odors in milk or cream that destroy the much coveted flavor which is characteristic of butter and cheese of the best quality. The clearest, most exhaustive and authoritative presentation of how odors and flavors find their way into milk that I have ever seen, is given by Prof. King in his Physics of Agriculture. He says: "The substances producing these qualities in milk make their entrance there in three different ways: (1) from the blood at the time the milk is secreted; (2) from the outside after the milk is drawn; and (3) they are produced within the milk after it has been secreted before and after it is drawn."

The better to understand this subject, let us briefly recur to some of the fundamental principles as to the composition of matter. The molecule is the smallest part of a substance that

can exist separately and still retain its composition and specific properties. The molecular theory of the composition of matter teaches that ordinarily these molecules do not touch each other, that however compact a body may be there is in it space not occupied by the matter composing it; and that the molcules are constantly in motion. "As the worlds in space are clustered in mighty systems, the members of each revolving about one another in inconceivably *vast* orbits, so each body is a miniature system, its molecules moving in inconceivably *minute* paths."

As molecular motion increases, the molecules are forced farther apart, with rise of temperature. When the motion decreases, the molecules come closer together with decrease of temperature. In other words, at a higher temperature of a body, its molecules are in more rapid motion than when at a lower temperature.

To feel fully his responsibility for the quality of factory products, the patron needs to bear in mind the infinitesimal size of the particles to which a body is capable of being divided. Let me briefly illustrate: Strychnine is bitter. Place a grain of strychnine in 1,750,000 grains of water. In each grain of the water, there will be 1-1,750,000 of a grain of strynchnine and can be distinctly tasted. These bottles contain the results of this experiment.

Dissolve 1 gram of 5. B. Methyl Violet in alcohol and distribute it through 1,000 cubic inches of water in a large flask. Pour out one-half of the colored water and fill to 1,000 cubic inches again. Repeat this operation until the eye can with certainty detect the color in this water. As many as ten divisions may be made. In the last 1,000 cubic inches of water there will be only a trifle less than 1-1000 af a gram of 5.B.-Methyl Violet, yet the color is apparent to the eye. That is, in each cubic inch of the water there is only 1-1,000,000 of a gram of 5. B. Methyl Violet. The results of this experiment are here exhibited.

Our knowledge or recognition of odors and flavors is due to the sensation caused by the infinitesimally small molcules moving through the air and striking our nerves of smell and taste. Instance the fragance of the rose, the flavor of the apple, strawberry or other fruit. King mentions a blind lady who took the glove of a stranger and, walking up and down

the aisles of a large audience room filled with people, handed the glove to the owner, made known to her only by the likeness of the odor from the glove to that escaping from the stranger, produced by an inconceivably small particle of the volatile principle striking the nerve of smell.

It is by the extremely minute molecules of the volatile substances escaping from the foot of the master, through his shoe, remaining in his path for hours, and finally striking the nerve of smell in the dog that he tracks his master.

I have dwelt at this length on the subject of the nature and divisibility of matter and the way we acquire a knowledge of flavors and odors to produce the conviction that small particles of dust, dung, urine or of any other filth, entering milk may separate into infinitesimal particles, disseminate themselves through the whole volume of milk and work havoc to the entire mass, by imparting to it their odors and flavors. Thus, one careless, slovenly patron may irreparably undo the neat, careful and painstaking work of his neighbor and thus foist upon the consuming public an inferior and unsatisfactory product.

It is the butter fat in the milk that chiefly absorbs and re tains the odors, agreeable or otherwise. The method of gathering the fragrance of various flowers for the manufacture of perfumery has a wonderfully suggestive lesson to dairymen. Plates containing fats are placed in chambers with the flowers. These fats absorb the fragence from the flowers and retain that fragrance a long time. They are sold as pomades and are used in the manufacture of the finer perfumes. Think for a moment of the perfumery the butter fat of milk must gather and retain from an unclean and unventilated barn or from an agitated barnyard heap. Certainly it requires no small amount of skill and art to so feed and handle a herd of cows as to impart to the product the finest flavor.

"Any volatile principle," says King, "which may chance to be present in the blood of the animal at the time the milk is being drawn will find its way into the milk and will impart a quality to it, the intensity of the flavor or odor depending upon the amount of the volatile principle present and the readiness with which it evaporates."

It is easy to understand how these volatile substances may be present in the blood from the feed furnished the cow, such

as onions, cabbage, rape, turnips; or by forcing the cow to remain in and breathe an atmosphere that is filled with foul odors, due to lack of ventilation and cleanliness. Such odors being taken into the lungs in the air breathed by the cow must enter the blood through the membranes of the lungs and impregnate it, which in turn imparts the flavor to the milk. It is to be recognized that just the reverse of this follows when the cows are kept in clean, well-ventilated barns and furnished with feeds of befitting fragance.

Damaging odors and flavors may be imparted to the milk from the outside after it is drawn. "If," says King, "the odors of manure, of urine, of ammonia, or any of those associated with the decay of organic matter are in the air above the milk, the rapid motion of these molecules will cause some of them to plunge into the milk and accumulate there until they become so numerous that just as many tend to escape per minute as tend to enter. The milk is then saturated with the odor in question. The warmer the air surrounding the milk and the warmer the milk, the more quickly will the condition of saturation be reached, simply because the rapidity of molecular motion increases with temperature, for when the molecules of foul odor are once inside the warm milk, they travel or diffuse downward more rapidly because it is warm."

If the milking is done in a stable that is unclean and unventilated, filthy, and filled with foul odors, it is readily understood how the streams of milk passing from the udder to the pail will force the contaminated air into the pail and impart to the milk its foul odors. The use of the separator under similar conditions must produce similar results.

Odors and flavors are also produced in the milk after it has been drawn, by the introduction into it of undesirable germs in the dust from the stable and the cow and from lack of cleanliness of vessels used in handling it.

If the milk is allowed to remain at body temperature and cool slowly, the gas-forming bacteria, whose habitat is filth, rapidly develop, producing undesirable odors, but if quickly after being drawn the milk is cooled to a temperature as near 40 degress F. as possible, the growth of these undesirable bacteria in the milk will thereby be checked and reduced to a minimum.

From the preceding statements, it plainly follows that the

patron who keeps healthy cows, in clean, well-ventilated and well-lighted stables, feeds them sound, wholesome food, causes them to be milked in a cleanly manner, and the milk handled at all stages in clean vessels and quickly cooled as soon as possible to a temperature ranging from 60 degrees to 40 degrees F., and delivers it to the factory free from chemical preservatives and with such frequency, that when delivered, it is in prime condition, meets his responsibility for the quality of factory products.

DISCUSSION.

Sec'y Burchard: In pursuing this subject, which I conceive to be one of the most important that can be presented in a dairymen's convention this year, and in its relation to the dairy industry in Wisconsin, it had been deemed fairly good policy to have an examination made by the Dairy and Food Commissioner's staff of some of the cream as delivered to your local creamery here with a view of ascertaining to what extent the farmers who were patronizing that creamery were following the practices that have been set forth in this paper or following the evil practices. Mr. Corneliuson, who was once employed by the Dairymen's Association, is now transferred to the Dairy and Food Commission, and he has prepared a very brief paper on the conditions as he found them here, which he will now read.

Mr. President, Ladies and Gentlemen: During the last few days it has been my privilege to acquaint myself with the practices and conditions under which dairy products are produced in the vicinity of Tomah and with that end in view I have visited the creamery here and 72 dairy farms.

In judging anything it is necessary to have some "standard of perfection" in mind by which the conditions can be compared or measured. In criticising the barns of this community I have taken as a standard, a barn that is clean and provided with a sound and impervious floor, well ventilated and

well lighted. By the term "well ventilated" is meant proper provisions for keeping the air pure, without causing draft or undue cold in the stable. By the term "well lighted" is meant enough windows to admit an abundant flow of light to every corner, and every foot of floor space of the stable.

After consultation with those most interested in this matter it has been deemed best for the purposes of this report, to refer in general terms to conditions observed, rather than to particularize.

Contrasting the conditions of the barns visited, some were found with ceilings, walls, windows and floors relatively clean. The floors were free from litter by refuse, or the droppings of the herd. Others were observed with ceilings and walls covered with cobwebs, dust and chaff from the fodder. In some of the worst, even the walls were befouled with dung. Some were without floors, other than those nature provided. In other instances floors were defective in that the planks were more or less loose, allowing liquids to pass through forming filth below as a source for the emanation of foul odors. Some were observed to be unswept and were littered with feed, refuse and dung.

For ventilation, reliances were placed in most instances, on the hay chute; in some instances an effort had been made for better methods, but with misdirected effort, as to the application of the principles of ventilation, and gave imperfect results. A ventilating flue about 6 inches by 8 inches was observed in one barn with a herd of 13 cows several head of young stock and 3 or 4 horses, and thus fell far short of the four square feet of ventilating flue required according to King for that number of animals.

The lighting of the barns visited was in general better than the ventilation, some barns, however, had no windows. A goodly number of the barns met, approximately, the requirements of the standard, as given in this paper. The entrance of light through some windows was obstructed by the accumulation of dust and cobwebs.

In some of the herds, the conditions of the cows, as to cleanliness, was above reasonable criticism, in others a reasonable standard of cleanliness was fairly met, while others were befouled by their own droppings.

The separators were located either in the barns or in the

house. Of those located in the barns, some were just behind the trench, come in the feed alley, while others were in a room partitioned off for this purpose. Of those located jn the house, some were in the kitchen, others in the cellar and a few in the woodshed.

Some were thoroughly washed each time after using—a practice that should be followed by all. Others were washed only once a day, and a few were not washed even that often.

By some, the cream was cooled by turning from can to can, or by setting it outside for a while to cool, with frequent stirrings. By others the cream was placed in a cool room and left there until delivered. By others, it was kept in the kitchen until delivered. A few kept it in the cellar. A very few considered a cool parlor none too good for keeping the cream.

Last Tuesday Messrs. McAdam, VanDuser and myself inspected the cream as received at the creamery. Some lots of a poor quality were particularly noted, and some samples were saved and afterwards tested by a fermentation test, the results of which bore out the defects as observed at the weigh can. This investigation was also followed up, in some instances by an inspection of the premises, where such cream had been produced. For instance, one sample had a strong potato flavor at the weigh can; the fermentation test showed musty cellar flavor; the inspection of the premises brought out the fact that the barn had no ventilaion, was insufficiently lighted, the separator employed was a so-called water separator kept in the cellar having a large amount of potatoes stored there and permeated with a musty odor. Another one showed a very bad flavor, at the weigh can the fermentation test gave "rank unclean flavor," the inspection of the premises proved that both ventilation and light in the barn were very poor, general conditions very bad, the cows were very unclean, a water separator was used which was washed once a day, the cream was not cooled and was kept in the pantry. Another sample showed unclean and tainted flavor at the weigh can, and also by fermentation test. On the premises the barn had neither light nor ventilation, the cows were not clean, the separator placed in the kitchen and washed once daily.

At the creamery the utensils and the surroundings were found in good conditions and everything indicating that the

work done, as well as the management, is above criticism. An improvement, however, could be made by installing a pasteurizer and a starter can, and pure or commercial starters employed in the ripening of the cream.

DISCUSSION.

Secy. Burchard: I don't know that any more can be said about this matter than to quote from my report. It has been observed that in our previous conventions, by reason of the fact that the butter makers and the cheese makers have formed themselves into conventions by themselves, that our exhibits of butter and cheese were extremely limited, and but very little interest was taken in them from the fact that the great majority of the farmers who attended the convention were only concerned in producing milk or cream which was sent to the factory or creamery. In view of these conditions the executive committee of the Association, at its meeting last March, passed a resolution which is, in substance, that premiums on butter and cheese should be discontinued, and in lieu thereof premiums should be offered for milk and cream.

It became a matter of some importance to know just how milk and cream could be judged and there was a good deal of reluctance on the part of those whom I thought were quite competent to pass judgment on this matter—to undertake it. But I persisted and told them that it was useless in my judgment for us to harangue about delivering good milk and cream unless there was some way devised by which the butter maker or the cheesemaker could form some sort of an approximately correct judgment as to the quality of the milk or cream when it came to his intake, and that I thought it was the province of this Dairymen's Association, in some way, as best it could, to block out a plan. They received these suggestions of mine very kindly and made some experiments and came to the conclusion that by the use of the Wisconsin Curd Test and the Fermentation Test and the trained nose, they could tell very accurately the condition of milk, and so we have invited the people to send in samples of milk and cream here to contest for premiums to be judged, as I understand it, by Mr. Baer, who has had very

considerable experience in this line and who will now explain what has been done.

You will observe that in order to make this a fair contest the per cent of fat must be ignored—for instance, if one kind of separator gives a 40 per cent cream and another kind of separator gives only 30 per cent cream, it would be unfair to the 30 per cent man for it to be held that the 40 per cent cream was better.

The real questions to be considered are the flavor, cleanliness and—I don't know what else. You see this has to be done with great judgment, because it would be unfair, for instance, for a man who milked a herd of what we might call common cows whose test would run perhaps 4 per cent or less, to have his milk compare with milk from a Jersey or Guernsey herd, which gives 5 or 6 per cent milk and to say that the milk of those cows contained more fat than the milk of his cows and that therefore it is better milk. You cannot entirely depend on the test for fat in judging a cow. If a cow gives enough milk at a low per cent test to bring up the total amount of fat in her milk, that is all right, regardless of whether it is a low test or a high test. In other words, you must consider the quality of the cow and we know we cannot determine anything about the real quality of milk by simply putting it through the Babcock test and saying it contains 5 or 6 or 4 per cent of fat.

Mr. Baer: Mr. Chairman, Gentlemen of the Association, Ladies and Gentlemen: I will state right here that butter fat tests were made of all these cream and milk samples. We, as inspectors, would naturally do that: we want to know whether they complied with the state law and I am glad to report that they did, they ran far beyond the state law.

I wish to state that you gentlemen put up a very hard proposition in fixing this duty upon your judges. These milks and creams are exceptionally fine, far above the average and we worked very earnestly and very hard in order to determine who was to get these awards. We had Mr. Kundert, one of the state chemists, with us, and he subjected all these samples of cream and milk to his tests for formaldehyde and for borax, finding no traces of either, as he anticipated.

Now, Mr. Moore and Mr. Cannon and myself did the judging. After considerable experimental work and discussion and trying of samples backward and forward, we decided on a sort of a score card and we divided this score card for milk into two general subdivisions. Under the first, which we named "Flavor," we placed taste and smell at 25 points out of a possible 100 each. Under the head "Condition," we placed the curd, the fermentation test applied to milk, at 25; cleanliness 15, and acidity, 10, and we determined the acidity by means of the well known acid tests that creameries use in their creameries and cheese factory work.

Now, on that basis we did our work and I will read you scores of those who submitted milk samples to us after which I will read you the prize winners in the milk class.

We prepared a similar score card for judging cream, putting "Flavor" as the first department, subdividing that into two divisions, "Taste" and "Smell," giving each 30 points out of a 100.

Milk and Cream Exhibits.

There were twelve entries in each class. These were all tested for fat and the presence of preservatives and were found to comply with the laws of Wisconsin. That is, every sample was free from preservatives; all the milk tested above three per cent fat, and cream above eighteen per cent.

The scale for judging both milk and cream embraced the two essential items of Flavor and Condition. Flavor was subdivided into Taste and Smell, and for milk 25 points and for cream 30 points were assigned to each. In the class for milk, Condition was subdivided into results of Curd test, 25 points; cleanliness, 15 points; Acidity, 10 points. It being impracticable to apply the curd test to cream, Condition was determined from Cleanliness, 20 points; Acidity, 20 points.

The prize winning exhibits received the following scores:

Milk.

No. of entry.	Name of exhibitor.	Flavor.		Condition.			Total.
		Taste.	Smell.	Curd.	Cleanliness.	Acidity.	
		25	25	25	15	10	
10	Edgewood Farm, Pewaukee, Wis	25	25	25	15	9	99
5	F. W. North, Norwalk, Wis	24½	24	24	15	9	96½
2	R. B. Robertson, Tomah, Wis	24	24	24	15	8	95
3	Henry W. Schneider, Tomah, Wis	24	24	24	13	8	93
9	J. G. Hickcox, Whitefish Bay, Wis	24	24	2 ⅛	14½	6½	92½

Cream.

No. of entry.	Name of exhibitor.	Flavor.		Condition.		Total.
		Taste.	Smell.	Cleanliness.	Acidity.	
		30	30	20	20	
2	R. B. Robertson, Tomah	30	29	20	20	99
6	Wm. Brennan, Tomah	30	29½	20	18	97½
5	F. W. North, Norwalk	29	28	20	20	97
1	C. C. Hill, Tomah	30	28½	20	18	96½
12	Elmer Hill, Tomah	29⅛	29½	20	17	96

DISCUSSION.

Ex-Gov. Hoard: I want to ask Mr. Corneliusson whether in this inspection around here (Tomah) you found any of the barns using the King system of ventilation?

Mr. Corneliuson: No, sir.

Ex-Gov. Hoard: Did you find any of the farmers knowing anything about it?

Mr. Corneliuson: No, that I was aware of. There was one man who had a small flue. I presume that that man

knows something about the King system, but he did not understand the proper principles, he has got too small a flue in.

Ex-Gov. Hoard: Had he his intakes right, letting in the air from below outside and up even with the sill on the inside?

Mr. Corneliuson: I don't recollect whether he had that or not.

Ex-Gov. Hoard: This is one of the most important propositions connected with the health of our herds.

Mr. Corneliuson: This man made the mistake, not alone in making the flue too small, but it was not air tight. The air flue should be air tight or practically so, in order to draw well, and his was open in the joints.

Mr Aderhold: Now, we are on this stable question, I would like to introduce a resolution that bears on this question.

The Chairman: There is no objection.

WHEREAS a large portion of our milk producers are using stable fixtures that fail to keep cows clean, and are housing their cows in poorly ventilated stables; and

WHEREAS, on account of our dairy laws and the inspection of stables, a big movement is on foot for the improvement of stable conditions; and

WHEREAS, the majority of our dairymen lack knowledge in stable matters, and complete instructions along that line are not readily available, therefore

Resolved, That we request Ex-Governor Hoard as chairman of a committee on Agriculture of the Board of Regents of the University of Wisconsin to use his influence with the management of the Agricultural College in persuading it to issue a buletin illustrating and describing in detail a few of the better class of cow stalls, the King System of Ventilation, and such things as make for sanitation in dairy stables.

Mr. Aderhold moved the adoption of the resolution as read. Said motion being duly seconded, it was put to the house and unanimously carried.

Mr. J. G. Moore: Mr. Corneliuson spoke in his paper about some improvements that might be put in the local creamery here. He spoke of the pasteurizing and starter can. I would like to ask Mr. Corneliuson whether the cream comes in

rich enough in fat to allow the use of the starter can and the starter.

Mr. Corneliuson: The cream received at the creamery here tests about 24 per cent on the average. It is rather low for the employment of the pasteurizer or a commercal starter and that is an important question for every creamery patron to consider, the richness of the cream. A great many people think that when they have a large number of pounds of cream that they get more money,but that is a mistake;they lose the skim milk and the loss in the buttermilk is greater. The thinner the cream is the higher the churning temperature which must be employed, and that increases the loss of fat.

The Chairman: It is to the patron's interest then to produce heavy cream rather than light cream?

Mr. Corneliuson: Yes, every farmer should make it a practice to produce cream not less than 30 per cent, and up to 35.

A Member: I would like to have Mr. Corneliuson give some of the losses in such factories when they have gathered cream.

Mr. Corneliuson: I remember one instance of a creamery that I visited some time ago. They labored under great difficulties along this line, their cream was unusually thin; the average fat throughout the year was, if I remember correctly, 22 per cent and they lost a large amount of money through that one cause. The total loss sustained by that factory on account of this practice was estimated to be over $2,000 a year. This amount of money could have been saved and been distributed through that locality to the various patrons if they had understood the matter. That was their yearly loss and they could have saved that money without the expenditure of a single cent, simply by a little attention to details. That is a very important question to be considered in every gathered cream factory, that of the richness of the cream, as well as the quality of it; in fact, the quality of it largely depends upon the richness of it, because the thinner the cream the easier it goes off flavor.

REPORT OF AUDITING COMMITTEE

The Auditing Committee have examined books and vouchers of the Secretary and Treasurer and find the same correct as reported by the Secretary.

H. C. TAYLOR,
C. P. GOODRICH,
H. D. GRISWOLD,
Auditing Committee.

The Chairman: We have with us this afternoon Prof. Haecker of the Minnesota Experiment Station, formerly of Wisconsin. He has for many years carried on many original and close experiments along dairy lines. It appears that he has experienced some changes in his sentiments as well as in his experimenting in regard to dairy cows.

It gives me great pleasure to introduce Prof. Haecker of Minnesota.

Prof. Haecker: It always affords me special pleasure to meet a Wisconsin audience, for I always find in it quite a number of old personal friends, and I always like to come to Wisconsin because I feel under many obligations to the State that has probably done more to develop dairying during the last quarter of a century through its influence than all other states in the Union combined. We owe the State a debt that we will never be able to repay.

THE CHANGE IN SENTIMENT IN MINNESOTA TOWARD THE DAIRY COW.

Prof. T. L. Haecker.

The subject assigned me is an unpleasant and difficult one to discuss because it brings to mind many incidents which if brought out in detail would lead to personalities which I have always aimed to avoid, and difficult because of a lack of authentic data in regard to the performance of the so-called dual purpose cattle.

When young and inexperienced in handling cattle, and when a cow was a cow, I settled on a farm in the town of Cottage Grove, east of Madison. Two cows were purchased, one a fine two year old Short horn heifer, fresh in milk, and the other some five years old. The heifer I considered a nice animal. She was deep red, compact and smooth, and being fresh made a good appearance. The cow was a roan, raw-boned, pot-bellied, and her general appearance indicated to me that she must be what was then termed a hard keeper. In a couple of years the perversity of the heifer brought her to the shambles, for she would persist in converting her feed into meat—when it was milk that I wanted. After this time I had an opportunity to take on shares two twin Jersey heifers; one was noted for her beauty—symmetrical and nicely rounded out, while the other was considered homely, for she was always poor, angular and pot-bellied. But being twins from a famous cow, and by a registered sire of approved lineage, the assumption was that both would prove to become good cows. Certainly the smooth and handsome one would for she won the first premium both as a yearling and a two-year old. During several succeeding years, during which they received good care, the beauty failed to make good either as a breeder or milker, while the other was prolific and far exceeded our expectations at the pail.

During the summer of 1882 I was commissioned by the regents of the University of Wisconsin to visit some noted dairy herds in New England, and brought back a carload, with the understanding that I should have the privilege of selecting one first, and they were then to select what they wanted and

I was to take the rest. There were some so-called beauties among them. I selected one, and then theirs were selected, and I took the remainder—among which there were no beauties. Notwithstanding the experience that I had had, I felt at first that I had the worst of the bargain. Records were kept in both places and time showed that my first choice proved the best in the lot, and those that had been left for me made records that I was proud of. Later I bought two more carloads from New England upon my own responsibility. One was composed of Jerseys and the other of Guernseys, and among them was Sunbeam, the dam of the famous Yeksa Sunbeam. With every individual in these two carloads time showed that there was a clearly defined relation between form and ability to perform at the pail, though the details of the dairy form were not clear to my mind and the same was true in regard to the relation of form and the nervous or what might be called the dairy temperament, first observed by Governor Hoard. But enough had been learned by close observation to fix in my mind the importance of dairy heredity combined with a certain type. So, when unexpected circumstances resulted in a call for me to go to Minnesota, and to bring a load of cows, the lessons learned were not ignored, and such cows as Houston, Sweet Brier, Tricksey and others of equal dairy capacity were added to the station herd.

The first winter I had little to do with dairy stock, giving all my time to the manufacture of dairy products, for it was the general conception then that instruction in dairying had strictly, if not solely, to do with making butter and cheese.

Soon after the close of the school of agriculture it was suggested that my services be dispensed with during the summer, but the regents did not give their consent and I was directed to spend the summer in visiting all the creameries and cheese factories and all the breeders of dairy stock, and generally familiarize myself with the status of the dairy industry and its future prospects. In the southern part of the state I found many breeding herds of dairy cattle. Along the southern tier of counties some half dozen herds were found in some counties, and many farmers who made no pretensions of breeding stock for sale kept at the head of their herds full blood dairy sires, and there was almost a universal trend towards breeding to sires bred especially for milk production. In all my travels

I found only two instances where men were interested in breeding stock that is now called dual-purpose; one a business man living on a small farm adjoining a town, and another a farmer who had a small herd of Swiss cattle. Even in the Red River Valley in the vicinity of Crookston and Moorhead, I found a number of fine herds of full-blood Jerseys. There appeared a universal sentiment among patrons of creameries and cheese factories that it was desirable to breed to dairy sires, since milk production was proving so remunerative and butter making was so rapidly restoring the fertility of the soil which had been impoverished by constant wheat raising. During some half dozen years there was a constant demand for dairy sires, and breeders within the state found ready sale for all their surplus breeding stock and many were brought from other states to make good the shortage in the state.

After bulletin No. 35 was issued the breeding and buying of dairy stock was greatly stimulated. This infusion of dairy blood into Minnesota herds had a marked effect in increasing our dairy products and cancelling the mortgages on our farms. But unfortunately the marks of dairy breeding were as evident among the steers that were shipped to market as it was among the heifers that were kept on our farms for milk cows. The meat combine took note of the change and resolved that something must be done to check the farmers in breeding to dairy sires. The edict came from the packers that all steers showing dairy markings must be cut in price. This order became effective at once, as practically all steers under the meat combine arrangement had to be shipped to the packers for slaughter. Through some mysterious influence some of our teachers in the departments of animal husbandry in our agricultural educational institutions suddenly discovered that steers from dairy bred stock were no good, that the meat was of poor quality and there was greater percentage of fat on the internal organs; that they carried a lower percentage of valuable cuts, and that so much more feed was required to a given weight that they were unprofitable. Some even went so far as to advise farmers to kill all dairy grade male calves. For several years there was a systematic campaign urged against breeding to dairy sires. At the stock yards, steers carrying any color markings betraying an infusion of dairy blood, were marked for a sharp cut in price, no matter how smooth, well rounded

and finished they may have been. Farmers were advised by the teachers to breed their milch cows to dual purpose sires, preferably to Shorthorns of a milking strain, well knowing that this strain had practically become extinct because Scotch Shorthorns had been the fad for a decade. Considerable headway was also made in the introduction of Red Polled blood into the state, and some ten or twelve breeding herds were started in the state. The vigor with which this war on the dairy sire was carried on by some of the teachers made it appear that there was some pecuniary interest at stake, though this is not herein affirmed. At all events the attack on the dairy sire was effective. I am in a position where I can measure from my correspondence the trend of public sentiment very closely. During the agitation there was a gradual decrease in the number of inquiries for dairy sires, and inquiries began to come for sires from milking Shorthorns and Red Polls. Finally there was rarely any inquiries for dairy sires and every one seemed to want something that was good for both meat and milk. This state of affairs continued for several years. Then an occasional letter was received asking for dairy bred sires. These could readily be secured at very reasonable prices. But as time passed, the demand for dairy stock rapidly increased, and as many of our dairy breeding herds had become so depleted, only a few sires and scarcely no females could be secured. During the years when the demands for dual purpose stock were so great, our dairy herds, especially the Guernseys, were nearly all taken by Wisconsin breeders. In Freeborn county there were two herds of Guernsey cattle deep in the blood of the noted Yeksa family that were picked up by two Wisconsin breeders, at prices that good grades should bring. Two years ago there was not a locality where a carload of grade or full blood dairy cows could be secured. While four years ago our dairy stock was carried into Wisconsin by the carloads, at merely nominal prices, during the past two years they have been coming into the state in carload lots at double the prices. During the past year I have received more letters asking where dairy stock could be secured than I have received in any one year since I have been in Minnesota, and among them all there has been only one that called for a dual purpose sire. In many of them it was stated that they had been led to breed beef or dual purpose sires and that it resulted in disappoint-

ment and great pecuniary loss. The dual purpose fad has cost our people many millions of dollars, and this is clearly shown by statistics.

The number of milch cows in Wisconsin is given in the last Year Book of the Department of Agriculture as 1,183,531, and the value of the dairy products is given in bulletin No. 140 of the Wisconsin Experiment Station in round numbers as $46,000,000, being approximately a gross receipt per cow of $39. The Year Book gives the number of milch cows in Minnesota as 903,796. The best data we have on the gross receipts from dairy products is $26,100,000, being $29 per cow. From this it appears that the receipts per cow are $10 more in Wisconsin than in Minnesota; that if the cows in Minnesota earned as much as they do in Wisconsin, our receipts would be $35,137,960, and that for some reasons we are annually losing $9,037,960. I believe the chief cause of this enormous loss is the fact, that in Wisconsin there are large districts that are employing dairy bred cows, while in Minnesota the almost universal practice is the use of the so-called dual purpose cow. While there is now a great demand for dairy bred sires, but few are available, and it will take a decade to get back to the position which we formerly occupied, and in the meantime our losses will aggregate not less than $75,000,000. This costly experience teaches that it doesn't pay to make a retrograde movement in an industry of such vast magnitude.

DISCUSSION.

Prof. Emery: I want to make a statement or two with reference to this Bulletin 140. In that estimate of $46,000,000 gross income of Wisconsin, no account was taken of the by-products of the factories. When next year, the report of the Dairy and Food Commission is published, it will show that an estimate of $10 a cow is made for the by-products of creameries and cheese factories and by adding that the total annual income of Wisconsin dairy cows is upwards of $47,000,000 annually.

But I want to say further that the statistics given in the forthcoming report and also in Bulletin 140 were taken from

the recent census taken by the state; that I have given particular attention to it in connection with the secretary of state and know that a great effort has been made to secure as great a degree of accuracy as possible, facts that are as reliable as can be, and while we know that there are errors I believe they are approximately correct, and it seems to me from knowledge I have gained that they have been taken with as much care as were the statistics of the United States officers.

Prof. Haecker: I was going to say that I am quite sure that the estimate appearing in Bulletin 140 is correct, because a little over a year ago, figuring on our yield of cheese and butter in finding what I did, that the annual receipts were $26,100,000, I applied the figures to what data I could get from Wisconsin and found that their receipts were $46,-000,000.

Ex-Gov. Hoard: Prof. Haecker has given you in a sort of a rapid glance some idea of the very serious character of the results of a mistake, upon the fortunes of that state.

Hoard's Dairyman has been battling this heresy and humbug policy of the dual purpose cow for a dairyman for years, and has never turned its back to the proposition for one moment. It believed years ago—thirty years ago—that the way for the dairyman was straight and narrow and that there was no double purpose proposition in that way.

There is a little point I want to make right here. The other day I went out to Iowa. Iowa is getting in the same way; Iowa farmers are coming to the men who have been teaching them and saying to them, "You have been telling us to breed to dual-purpose, and we have got no milk. What good is it for us to breed in this way and get no milk?" And then these people have been saying, "Well, now, we, you know in Iowa, have a large surplus of very desirable feed and we need to use a dual-purpose animal to eat up this feed." And then the farmer turns around practically and says, "Why can't we use up the feed on a good cow as well as on a poor cow? Why should we breed for a cow in order to use up a lot of feed?" "Oh, that is for the fun of it," Prof. Haecker says. Well, you know this practice of getting down to the sharp edge of a proposition is good. The Professor has not given you all; he spoke of the by-products and I want to illustrate one point more.

The eyes of the whole country are turning upon Wisconsin as a source of good blood to go out and enrich the lines of cattle in other states. Not only $47,000,000 has come from the cows of Wisconsin, but he has not said anything to you at all as to the amount of money that has come into Wisconsin for this very character of good blood.

Some of our Wisconsin dairymen have been fooled into believing in this dual purpose. They were like the boy was who went out hunting and the old man told him to be careful and not shoot any cattle down in the woods. "Well," he says, "Dad, I have loaded the gun so that I can't do that. I have loaded it so as to hit it if it is a deer and miss it if it is a calf." That is dual purpose. Another fellow, a dual purpose man, went to be examined in the old fashioned way by the school committee to teach school, and they asked him if he believed the earth was round or flat. "Well", he says when asked that question, "I teaches 'em both ways, just as they want it."

Now, this idea of "hitting it if it is a deer and missing it if it is a calf," or "teaching them both ways, just as they want it," has been a delusion and thousands and thousands of farmers have wanted that same delusion and wanted it bad. Not unreasonably so, but because they hoped that there was some way by which they could get just as much milk and besides that, sell a good beef product.

You ask that same farmer if it is consistent that a man should expect to breed for the race track and at the same time get a draft horse? Why, no. Ask him if it is consistent for a man to breed for a bull dog and get a fox hound. Why, no, of course not. But it is consistent for a man to breed for beef and get butter. The days of humbug and Barnum are still with us.

The Chairman: If you have been engaged in breeding pure bred dairy cows for twenty-five or thirty years and have come up against these fellows who are endeavoring in every part of the country to lead the dairyman to believe that the dual purpose cow is the only salvation in dairying, you have been obliged to sit still and listen to a false gospel and keep your mouth shut a long, long time. As we talk today it seems to me from this standpoint that we are kicking a fellow when

he is down, that we are hitting the enemy when he is already prostrate before you.

The time was never so ripe for teaching these things as it is today, the eyes of the brighest of the dairymen in this state, in Minnesota and in Iowa are raised and they say, "What good thing have you to tell us? Come over into Macedonia and teach us the things that we want to know." Down at Madison, at the Experiment Station, we had some of these teachers that were trained in the schools of the dual purpose cow, and they were there holding an official position, and with the human equation producing preconceived notions which have been demonstrated to the dairy fraternity of Wisconsin, the same false doctrine that we are meeting with today and it is prostrate before us. I have visited hundreds of farms where there was a grade bull at the head of a herd and on the table in the house were pamphlets and bulletins from Minnesota and Iowa and Wisconsin, all teaching these things and my heart sank within me and my tongue become still, because I knew what these fellows were coming to. It is no time to stand on our feet and say, "I told you so."

Gov. Hoard and I have talked this matter over many times and we have stood up and will stand up to show these fellows the foolishness of their mistake. The great pendulum of the true gospel is swinging back to us. Let us not make fools of ourselves; let us not think we are going to get rid all at once of these things, but let us continue to work to place dairy sires at the head of our herds in Wisconsin and the call will be long continued and all the time for the surplus dairy bred stock at renumerative prices.

Secy. Burchard: You haven't said what you started to say I am sure.

The Chairman: I don't want to do too much talking. I want to say this, however: we have down there at Madison a conscientious, clear-thinking dairyman that is bringing this dual purpose cow out of the dairy barn on the Experiment Station. The Red Polled cow is gone from there, the Shorthorn dual purpose cow has come out of the barn and the right kind of attention is being given to the dairy breeds, the Holstein, the Jersey, the Guernsey and the Ayrshire and other splendid cows, also some Brown Swiss and some that we are going to experiment with in Wisconsin. You will find that

it will be the simplest and easiest thing in the world for Wisconsin dairymen to take up with this kind of true gospel. They are ready to receive it now and we are going to lend them all the assistance we can to help our brothers in the dairy business in the state of Wisconsin through the Agricultural Station. Anything further on this subject?

Secy. Burchard: In the current annual report of the Wisconsin Experiment Station you will find in the concluding sentence words to this effect: "From our records, kept from 1898 to the present time, it has become apparent that the dual purpose cow has no place whatever on the dairy farm and that no dairy farmer can afford to breed to the dual purpose idea."

Now, quite closely related to this question is that matter of constitution, etc. I would like to have you hear a word on that question from Mr. Glover, whether it is true or false that the dairy cow has an inferior constitution to the beef cow; whether, in other words, what we hear so much about, breadth of chest, chest girth etc., have anything to do with the heart and lungs capacity or anything of that kind?

Mr. Glover: Mr. President, Ladies, and Gentlemen: Before I start to tell what General Burchard has in mind, I want to say just a word further on this subject of the dual purpose cow. It has been pretty hard for me to keep still as much as I have since I have been here, but in the presence of my two associates I have thought it best to keep still and let them do the talking, for if I made any mistake they would both get after me, and I would be between two millstones.

Looking over my mail the other day, I found a letter from a man writing from Minnesota or from Iowa, and saying that a few years ago he wanted one of the Professors in the Iowa Station to pick him out thirty cows, and they did so and sent them to him as ideal dual purpose animals. He writes me: "After five years I have got rid of nearly all of them, I am through with that kind of breeding. It has been very expensive to me."

That is one of the many letters that are coming to us at the Dairyman's office constantly.

The other day, in looking through a Bulletin from the Iowa Experiment Station, I found they had four dairy steers and weighed the hearts and lungs and also four beef steers and

weighed the hearts and lungs. It has always been claimed and taught by many of our teachers than an animal's constitution depended upon the depth and width of the chest, the measurement around it; that is, if an animal was broad between the legs and deep, it showed an animal with a great constitution. That has been the guiding thought, I think, lots of times in the human race as well as in the bovine, but to my surprise when I came to compare the weights of the hearts and lungs of the dairy bred steers and the beef bred, I found that the dairy bred animals were 54½ per cent larger per thousand pounds live weight. Now, it would seem that external measurements and observation were not true indices of the size of the lungs and it brought up this question to us, Does the heart girth bear any relation to the constitution?

Mr. Everett: What was the difference in the size of the hearts?

Mr. Glover: The hearts in the dairy steers were a trifle larger. There were four beef animals and four dairy animals, and I will say to you that Prof. Voss has done some very interesting work along this line.

Prof. Haeker: This is in harmony with the data that we have at the Minnesota Experiment Station and have had for several years, but there has not been a disposition to publish it. When Sweet Brier was dissected, it was found that they had never found as large a pair of lungs as Sweet Brier had; in fact, all of those dairy cows, where any post mortem has been held and their lungs and hearts examined, have shown that those organs were very large for the size of the animal.

Ex-Gov. Hoard: I think it is something like fifteen years ago that I followed certain cows to the butcher block in Fort Atkinson and examined the size of their lungs and hearts and also followed certain beef bred cows, and I found the same thing to be true, and I early saw that the popular idea on that subject was a fallacy.

But I want to give you a little pointer, and that is this. A race horse sometimes looks as though both his fore legs came out of the same hole, doesn't he? You have heard men say that. A thoroughbred race horse will run a mile, say in 1.40. That horse has to use more heart action and lung action in running a mile in 1.40, than a draft horse would use in a week of hard pulling and yet, they tell you that the shape

of the race horse indicates that he does not have large lungs, does not have large heart action.

A dairy cow has to use her heart and her lungs tremendously to evolve forty pounds of milk a day. The milk must come from the blood, the blood must come through this circulation, —look at the great milk veins on the belly of a fine cow. You don't find that on the belly of the beef cow. No, those veins are the veins that take the blood back from the udder to the heart, and that shows you that here is provision made for tremendous circulation of blood from the udder to the heart and going around the other way back, constantly pumping blood to make forty pounds of milk a day. Could a small, weak, poor heart do that? Nature never fails you nor herself and consequently the dairy cow has a large heart and big lungs, and yet people have fooled themselves with these false judgments of conformation for all these years. So it is for the horse; so it is with dogs. Notice the big bull dog with his legs spread way out, he looks as though he had lungs for everybody. Turn to the pointer or the setter, turn to the greyhound, the foxhound. Don't these things indicate to you and me that we ought to judge things from the standpoint of nature and judge things from the standpoint of true principle?

Now I throw out these ideas that every farmer ought to become an independent thinker, an independent reader, a student of dairy cattle.

Sec'y Burchard: This bulletin that Mr. Glover referred to, telling about the four dairy steers and four beef steers that were killed in Iowa, contains information along another line that may be of interest here. It is claimed that the dairy steer, when fattened, does not bring as much in the market as a beef steer, and that is true, but there are some other considerations to be taken in connection with that and I think Mr. Glover can give us some of the figures and we will be glad to hear them I am sure.

Mr. Glover: To make it short and get at the subject quickly, I will say this, that those four dairy steers were fed alongside of four beef steers. We will not enter into the particulars, but it was simply four special beef steers against four special dairy steers. The dairy steers made just as good use of their grain as the beef steers did, perhaps a trifle better in a live weight gain. That is, it took so many pounds of grain and

hay to produce a pound of beef and it took about the same amount to produce it in the dairy steers. These steers were killed and sold; the dairy steers averaged in market price $42 apiece, the beef steers $60 apiece, there is $18 difference between the special beef animal and the special dairy animal in the price placed in the market.

Now, when these animals were cut up and sold, the dairy animals sold within $13 of as much as did the special beef steers, within $13 each, making a market discrimination of $5 per head in favor of the beef animal.

Now, I will say this, this experiment was carried on entirely by beef men and one of Kansas City's best judges placed the price on the respective cuts of both breeds.

Now, those steers were in round numbers two years old and taking it upon a sale price of $60 and $42, which the steers average, it makes a difference, as I said before, of $18 in favor of the beef, and you see that the beef steer was two years old, so you see that he returned $9 more per year for the feed consumed than the dairy steer, for all the feed that he ate.

Now, to come back to the dual purpose argument for a moment, let us see what there is in it. Suppose you are a dairyman and you are breeding cows that average you 350 pounds of butter per year, and you ought to have that kind, because it is possible to get them without injury or without any great exertion on your part. With just good dairy intelligence you can produce animals that will average 350 pounds of butter per year. Suppose that the average price of butter was 20 cents a pound; there is $70 for the butter from that special dairy cow that produces 350 pounds in the year.

Now, supposing that the dual purpose man produced a cow that would yield him 300 pounds of butter in a year, and that is very close, within 50 pounds of the other, and at 20 cents, that makes $60. Now, your dairy cow has returned you $10 a year more for the food consumed than the beef cow.

Now, granting the dual purpose cow will prduce a calf and your dairy cow will produce a calf, she still will return you $10 more for the butter than your dual purpose cow and the special beef cow only returns you $9 more in beef and the difference between $9 and $10 is exactly one dollar. Do I make it clear?

The Chairman: There is only one thing wrong with that hypothesis that you have given us, and that is you have credit-

ed the dual purpose cow with about 100 pounds more butter than she will produce.

Mr. Glover: I have given the dual purpose animal the very best chance as to the production of butter, and I have given the dairy cow as good a calf as the special beef animal has, and still the special dairy cow will beat the other.

I presented that argument a while ago to a dual purpose breeder, and he tried to avoid it and he wanted to avoid it by saying that the dual purpose cow would produce 350 pounds of butter, but he had to admit that they can't prove any such thing as that.

There are plenty of dairy herds that will average 400 pounds and the dual purpose cows I feel sure will not average more than about 160 pounds of butter.

The Chairman: C. P. Goodrich is spoiling to say something.

Mr. Goodrich: Yes, I haven't said anything for a long time. Down in Jefferson county, in the country right down around Hoard's Dairyman, they have got pretty good dairy cows. I took a cow census of 100 herds down there and the average product was 244 pounds per cow for all the herds, good, bad and indifferent. There is just one herd of registered Shorthorns in Jefferson county, and the owner of that herd has been breeding for milk production till he has spoiled them for beef and they are not very good for butter yet; his herd produced 184 pounds per cow and that is all.

The Chairman: Do you want to continue this any longer? Mr. Emery has something he wants to present.

Mr. Emery: Mr. Chairman, Ladies and Gentlemen: You have heard of many subjects of great importance relating to the dairy interests of the state and I have one here that I am sure is as important as any, and it will take me but a short time to present it and I wish to present it because it concerns every dairyman, it concerns every patron of every creamery in the state of Wisconsin. In my judgment, never in the history of this state has the local creamery industry been so menaced as at the present time. If our local creamery interests in Wisconsin, this magnificent dairy state with a total annual income from her dairy products of more than $57,000,000 is to continue and advance that industry, there are certain conditions that are absolutely indispensable.

First and foremost is cleanliness in dairy products, from cow to consumer. Second, in our creamery work the testing for butter fat of the patron's cream or milk must be done with intelligence, skill, painstaking care and absolute honesty.

I am not going to argue this question here, but that is an exceedingly important point for this reason, that any set of men or any man who deals with the public must so deal with that public as to establish and maintain confidence. The breaking down of confidence is the ruination of business and to maintain the confidence of patrons, the managers of creameries must see to it that the testing is done with absolute accuracy and absolute honesty. The patron who takes milk or cream to a creamery has a right to just what he takes there, every ounce of butter fat. What difference does it make today, when my cream is in the hands of the creamery and tomorrow when the cash for it is in the hands of the cashier of the bank? That cashier must handle every cent, account for every cent, and so, too, that creamery manager must account for every ounce of fat if the testing is done as it should be done.

Third, there must be no discrimination in railroad transportation by the railways between the various classes of producers of these dairy products. Now, we know that some of the greatest monopolies, some of the greatest outrages that have been practiced upon the American public have come about because of discrimination in railroad transportation. I want to give on this point a few statements. It is a serious proposition, and there is no body of men so called upon to deal with this proposition as the Wisconsin Dairymen's Association and the Wisconsin Creamery and Buttermaker's Associations.

A local creamery—I am not going to say just where it is and I am not saying that every local creamery does this—I give this as an instance of the condition that is beginning to creep into Wsconsin. It is firmly fixed in Kansas and Iowa and some other states, and this octopus is reaching out its tentacles to cover Wisconsin. A local creamery is charged one dollar per hundred weight to ship its butter to Chicago by express. Now, keep that in mind. At the same time, from the same place, the same railroad takes one hundred pounds of cream to Chicago for 25 cents as baggage. The cream is 40 per cent butter fat. It amounts to this, that the Chicago centralizers get their butter for 52 cents per 100 weight, for trans-

portation charges, while the Wisconsin local creamery must pay a dollar per 100 weight to get its butter to Chicago on the same train. I made this statement at the Buttermaker's meeting, and somebody said, "That Mr. Emery knows, or ought to know, that the creamery people do not get their butter to Chicago at that rate by express." Of course Mr. Emery knows that, but why shouldn't they? Why shouldn't the creamery man get his butter to Chicago going on the same train that the cream goes there, under the same rates? That is a fair proposition.

Now, gentlemen, this is not a square deal. In addition to this, the railway return cream cans free of charge; they do this by shipping as baggage. Thus it will be seen that by this action of the railways the Wisconsin local creamery is placed in a position of peculiar hardship. Neither the Chicago centralizers nor any other centralizers can get out of a farmer's cream any more, honestly, than the local co-operative creamery can get out of it; therefore, it is to the interest of every Wisconsin farmer to stand back of the Wisconsin local creamery. That is a thing we want to keep in mind. We want to remember how the beef trust of this country has driven out the local interests and then reached out its tentacles and got the American people under its control and destroyed the local butcher in the majority of cases, and destroyed, as Prof. Haecker has so well told us this afternoon, the dairy breeds. So I say again, it is to the interest of every Wisconsin farmer to stand back of the local Wisconsin creamery. I mean that. It is the business of the weakest local creamery to deal fairly with the Wisconsin farmers and of the farmers to deal fairly with those creameries. It is to the mutual benefit of all those parties, and they are standing in each other's light if they fail to do these things. The farmer gets all there is in his cream when he takes it to the local creamery—overrun and all.

The dairy sentiment of the state, the Railway Commission and all the forces of our state should stand like a solid wall in defense of our dairy industry as a part of Wisconsin; not only should they stand as a stone wall, but they should be as aggresive as a mighty army, seeking to gain what is right and just in these transportation matters. The Wisconsin Dairymen's Association and the Wisconsin Creamery Buttermaker's Association can do much to bring this matter to a right turn.

Ex-Gov. Hoard: I want to say a word on this. The other day two farmers came to my office and said they were stockholders in the South Koshkonong Co-operative Creamery. they came in and chuckled to me, because they said they were shipping their cream as baggage to Chicago and they were getting the Elgin price for butter for their butter fat. They looked as jubilant as though they were facing a thaw in winter—I didn't say what thaw. I said to them, "Now, boys, it is so easy to fool one's self." My observation of smart men is this, keen men, shrewd men, they never fool other people, they don't need to, the other people will fool themselves. But I said to these boys, "You are badly fooled." "Well, how? We are getting Elgin for our butter fat." I said, "You not only ought to get Elgin, but you ought to get 16 per cent more." "Why, how is that?" "Why, at your local creamery you will get everything that there is in it less the cost of making and that is $3 a hundred pounds of butter, three cents a pound. You have got everything in it and you will get 16 pounds of butter in every hundred pounds; you get not only your hundred pounds of butter, but you get 116 pounds, and here you only get your hundred pounds of butter fat and you think you have got the railroad by the tail, don't you?

The Chairman: And that 16 pounds is worth 30 cents a pound, $4.80.

A Member: They are getting it made for 2 cents a pound at that creamery.

Ex-Gov. Hoard: Well, those farmers stood and looked at me in amazement, their eyes began to get wide open when I talked about the overrun, and they said to me, "What is this overrun?" I said, "Boys, you live in my own town; my God, how long does it take a man to keep stupid? You don't know anything about the overrun?" Well, they had heard it talked about a little, but they didn't know whether it belonged to the butter or the buttermilk or what.

Now, that is an illustration of the way people do; there was a set of men sending their cream away and thinking they were doing God's service, stoning Stephen, and they were stoning nobody but themselves. There is where a great lot of farmers in Wisconsin are going to be humbugged about this shipping of cream to the city, Milwaukee, for instance, to men to make it

up into butter there. When it comes to the question of shipping cream for direct consumption as cream, I have nothing to say, provided they can get all the value that it will have locally in the butter market; but one thing I do want to say concerning the creamery, and that is this, there is no centralizer in Chicago that can get any more out of the butter fat than the local creamery can, none. Not only that, but they get less. Now, how do they make it up?

The Chairman: Do they sell it as cream down there or make it into butter?

Ex-Gov. Hoard: Why, these customers down there make it into butter and they would pick out some of the finest cream and get a cream price for it, but as a rule the centralizer in Chicago gets less for his butter, because he gets the worst kind of cream and then it makes several different grades of butter and between it all they don't begin to get as much as a good, clean, wholesome Wisconsin creamery for their butter.

Now, this is what is done in Kansas and Nebraska: The centralizers drove the local creamery to the wall, and the farmers turned traitors to their own interests and shipped in to the centralizers until they have almost killed out every creamery in Nebraska and Kansas, and then when they had the local creamery cleaned out by competition, they went to playing hob with the farmer himself and today the farmers there are selling their cows and quitting the dairy business, because they can't get justice, where they could have had justice if they had stayed by their own local creamery.

Oh, it is well for us to be wise as serpents about these things.

Mr. Moore: The Governor didn't say anything about the way the Chicago centralizers try to fix this thing, and the farmers don't know anything about it. They don't give the local farmer the entire weight that he is entitled to, or the entire amount of fat that he is entitled to in the test.

Ex-Gov. Hoard: My nephew, who was testing for one of these institutions in Chicago, wrote me a letter. He was competent, thoroughly educated, a fine creamery operator, and he went there and tested for that institution and he tested as he knew was fair to the farmers who shipped them the cream in there, and they said to him, "You must read that test lower." He says, "I can't do it and do it honestly." "Well, you will do it if you stay here." And they turned him out and he sent me

the full particulars of that matter. When you put your interests two or three hundred miles away you can't help yourself much. Can't any farmer be better served where he can step over and look after his own interests, watch the test himself? I want to see the local creamery maintained in Wisconsin; I want to see the farmers looking after their own business; to see them able to do it, to know enough to look after it. I want to see them educate themselves to read more, become more intelligent, and then I want to see them the peers of any set of men on God's green earth.

Mr. Corneliuson: I think there is one more point that would be well to consider in regard to this work. Men generally think they have a big price when they get Elgin for butter fat. Now, if that creamery was well managed they would get at least 16 per cent overrun. We will be conservative and say they are getting one-sixth; at the present price for butter, which is 33 cents Elgin, there would be about 5½ cents in the overrun, that is, what the overrun would amount to, one-sixth of the price of a pound of butter, which is just about 5½ cents.

Now, then, it will cost them three cents to make the butter they are still 2½ cents ahead and suppose you sold the butter on contract, you are just two cents to the good.

The Chairman: I will ask the Dairy and Food Commissioner, Mr. Emery, to formulate the ideas presented by him here, covering the transportation of creamery products, into a resolution to the Railroad Commission of the State and present it to this meeting tomorrow.

Adjourned to 9:30 A. M., Friday, February 22, 1907.

The Convention met at 9:30 Friday morning, February 22nd.

Mr. C. P. Goodrich in the chair.

The Chairman: The first business of the morning will be the report of the committee on nominations, which will be made by Prof. Emery.

Prof. Emery tendered the report of the committee on nominations, recommending as officers of the Association for the ensuing year the following named gentlemen: For President, W. J. Gillett, Rosendale; for Secretary, George W. Burchard, Fort Atkinson; for Treasurer, H. K. Loomis, Sheboygan Falls.

Prof. Emery: I move that Mr. Hill be instructed to cast the ballot of the Association for the officers named.

Motion seconded and the ballot so cast by Mr. Hill for said nominees, who were declared to be the duly elected officers to the respective offices for the ensuing year.

The report of the committee on exhibits being called for, Secretary Burchard reported as follows:

Secy. Burchard: I want, not as a member of that committee but as the secretary of the Association and charged by the Executive Board in the way of general looking after the details of the convention, to say that I made no effort this year to secure a large line of exhibits of machinery. We are very glad, however, to see the things that are here; they are the things that pertain more particularly to the dairy farmer, to the milk producer. The big things, the vats and the big churns and the pasteurizers and all that sort of thing belong now in the factories, but we have here and I am very glad to have noticed that they have attracted a very great deal of attentoin, these hand separators,—farm separators, as I like to have them called. They have come to stay. The three leading makes of farm separators are here and I do not think anybody who contemplates buying a separator, will make any mistake in buying any of these; in parting with his money he will get his money's worth back again, I am sure.

I notice Mr. Corneliuson mentions some of the farmers using the water separator, sometimes called the "dilution" separator and he said in a sort of an aside that perhaps the more proper way to pronounce it would be the "delusion" separator. I would advise those people, if they are here, to put a Babcock test over that "delusion" separator and see if they can longer afford to use it. You never can know for a certainty whether they do good work until you put the Babcock test over them and see what it says about the residue after the separator has taken off the cream.

There is here also an exhibit of a stall, which has attracted

a very great deal of attention. I am not here to say anything about the merits of that stall one way or the other, further than this, that you have heard here from time to time a great deal about the necessity of providing such arrangements in the stable as shall conduce to the comfort of the cow. If you are satisfied that this stall or any other arrangement for securing the cows in your stable will give your cows greater comfort than the manner you now have of fastening them, I beg to assure you that you cannot make a better investment than in providing something to add to the comfort of your cows in their stable. If this stall or any other arrangement that you may have for confining your cows contributes also to the cleanliness of the cow and of the stable, you make no mistake in investing in that direction.

Hence I say, these exhibits, while they are not numerous in number or elaborate in quality, yet they serve as samples and ought to be educative to this community.

WHAT THE PURE BRED SIRE HAS DONE FOR THE DAIRY INTERESTS OF JEFFERSON COUNTY.

Frank B. Fargo, Lake Mills.

Mr. President, and Gentlemen of the Convention, I appear here today in response to an invitation from your Secretary, to read a paper or speak on an important subject, certainly not because I am a public speaker or writer of papers, for he knows full well I cannot claim a reputation for either, but probably because I have something of a reputation as a breeder of full blood dairy cattle, and have decided views as to the best methods for the improvement of dairy stock.

What have full blood sires done for the dairy interests of Jefferson county is the subject assigned me, and if I repeat in this paper much of that which I read last week at Madison, I hope I may be excused, and, if I express my preference of breeds let it not be understood that I desire to belittle any of the choice breeds which have participated in making Jefferson county famous, or underrate the judgment of those whose preferences differ from my own.

The world's four great dairy breeds are well represented in Jefferson county, all have their admirers, and all have contributed to the reputation of our county. The Jerseys, the Guernseys, the Ayrshires, and the Holsteins, in the hands of those whose aim is, and has been, to reach high quality, by pure breeding, have brought about great results, and it is only needful to consult any of these breeders to learn that the use of full blood sires, chosen from ancestry of high quality in both of their families, have been the source of a large share of the success which has been reached, and is the only safe method of breeding.

Not having had personal experience with but one of these dairy breeds, I can better show my knowledge of what full blood sires have done for us, by taking that breed as a criterion by which to show the value of full blood sires, whether in pure or in grade breeding, and if by this course this paper sounds rather loudly of Holsteins, you wil pardon me.

Without doubt it is the desire of every dairyman to have a herd of cows which will secure for him the largest net income and give him the greatest amount of satisfaction in their handling. To this end, enterprising men have given attention, devoted their labor and money, with varying results; in the section where I have had my experience, the conclusion has been reached not in haste, but after years of careful trial tests as to butter producing qualities, and the other features which go to make up a really profitable dairy breed, that the Holstein Friesian class of dairy animals are superior to all others. Some years ago a very few of this breed were brought to Lake Mills. Later, Mr. August Wegemann bought of importers in the east, a number of choice selected registered Holstein Friesians and stocked his farm at what was considered by his neighbors fabulous prices; but his venture proved a grand success and created a desire in others to follow him in his undertaking. Probably Mr. Faville and Mr. Leonard were pioneers, but it fell to the lot of Mr. Wegemann to exemplify his courage by venturing upon the secure ground of pure breeding regardless of cost, and to him is largely due the credit of setting the ball rolling which has made Lake Mills the greatest Holstein center in the west. Full blood sires have been secured by farmers who possessed herds of other breeds, and the raising of grade Holsteins has become a large business, covering a radius of

some seven miles, including probably two thirds of the farmers in that section; and so extensive has it become, and so wide the reputation of Lake Mills as a Holstein center, that buyers from Maine to California, from Canada to the Gulf and from the Republic of Mexico, Cuba, and the Isle of Pines, are purchasers in our markets, at high prices both for full bloods and grades, until the demand has exceeded the supply, in spite of the hundreds that are being raised every year. It is safe to say that a hundred thousand dollars worth of these cattle have been shipped from our station annually for the past three or four years, which money has been left with the farmers who have been wise enough to engage in the business.

Some eight years ago I commenced looking into the quality of this breed, studying its history back to its mother country, Holland, and found that the ancestry of these cattle may be traced unalloyed for more than two thousand years, and that they have been carefully bred there, treated with the utmost kindness, until their natures had become imbued with that same kindness, and gentleness of spirit, and they are famous for their docility. Their ability to give their owners a fabulous quantity of milk which has given Holland an almost world wide reputation as a butter and cheese-producing country, makes them eagerly sought after in the best European markets at the highest prices. And I also found that the breeders of pure stock in this country, and the Holstein dairymen east and west were constantly accumulating evidence of the high qualities of this breed, corroborating the reputation it had at home; and after tracing up the pedigrees of different herds, I stocked my farm with full blood Holstein Friesians, built a barn of a size to accommodate over two hundred head, with all conveniences for feed, light and ventilation, a silo capable of holding 1,200 tons of silage. Soon my barn room was full of such stock as would bear inspection both as producers, and in breeding, and I was able to make advantageous sales and at prices which corresponded with the care I had taken in building up my herd and the quality of my stock. With others I have helped supply the farmers with choice young full blood registered sires and from these united efforts have come the remarkable results before spoken of in the breeding of both pure blood and grade Holsteins which has made Lake Mills, Jefferson county, the great center of this breed in the state and in the west, lifting

the mortgages from many farms, and brought to the community thousands and thousands of dollars to make happy the earnest, honest sons of toil with which our community is favored. It has been brought about by the persistent work of a few, but with a tardy response from those who could be most benefited. Still the results have been good, not so good, however, as they would have been, had the farmers more readily accepted the fact that nothing but full blood sires should ever be used, to convince them of which has been a hard task and still is somewhat in the way of reaching highest success.

Here permit me to say to the farmers present if you wish to better your herd, whatever may be your choice of breeds, use nothing but a full blood registered sire from a family of butter producers with a reputation on both their sire's and dam's side as such; have no trifling in this matter, better far pay a high price for the right one, than to have the wrong one as a gift; of this I speak both from observation and experience. In raising grades you are much more apt to get a producing herd in this way; and as the demand is greater than you can supply, your income is a certainty. You cannot be too careful in this, and especially so in starting a full blood herd, as I find that most new breeders buy anything in shape of a full blood if registered, paying no attention to what their ancestors have done. It is the high prices and lack of understanding of their necessity that brings this about. When stock is selected with records only on one side, they have to peddle out their stock for some time at low prices which discourages many and drives them out of the business; when, if they had started right, they would be in a position to ask prices and get them. Instead, they practically give them away, receiving probably $25 apiece for calves.

You will readily see from this that the demand for your cheaper bred stock is from your neighboring farmers for grade breeders to those who do not look ahead for results, and for your full blood advanced registered stock from breeders who have given it thought and are willing to pay the prices.

Giving calves away, reminds me of a story I heard the other day.

"A negro woman on a train in trying to get her baby to nurse used the following convincing argument. 'Take youah dinnah, Gawge Washinton Jackson; now Gawge Washinton

Jackson, you bettah take youah dinnah! If you don't take youah dinnah, Gawge Washinton Jackson, I'se a gwine to give it to the Conductoh!'"

You know by this time my choice of dairy breeds is the Holstein Friesian, and of course you want me to tell you why.

To begin with, as I said before, this breed has been constantly bred in Holland for two thousand years and so handled that it has such prepotency that not only color, but other characteristics have been transferred to the progeny in nine cases out of ten, where full blood sires are used, regardless of what they are crossed with. They are the largest dairy breed in the world, have the greatest vitality of any, which they universally hand down to their progeny, together with their docile character, and the good disposition of the calves is shown that they will drink from the pail almost from the start; they are large at birth, almost always strong and healthy, growing fast and fattening easily, making their veal exceptional. The great size of the adults makes them superior as beef cattle if it becomes desirable to thus dispose of any, and they fatten rapidly. As milkers they surpass other breeds in the quantity they yield, and though the milk may not be quite as rich in fat as that of other dairy breeds, the greater quantity fully makes up for the difference, leaving a much larger amount of skim milk for the use of the owner. Further than this, their milk partakes of the great vitality of the breed, and by scientists it is declared to be the safest milk for food, both for adults and children of any product.

Allow me to quote from J. Allen Gilbert, an eminent scientist, as follows:—"All in all, if one were choosing a human wet nurse he would look for just the characteristics in her that tution, quiet, easy going temperament, unifluenced by external we find presented in a Holstein cow, namely, vigorous constidisturbances, good glandular development, abundance of good milk, freedom from disease or tendency to disease, a good healthy child of her own, and a good family history."

As to the skim milk, it has a larger percentage of food qualities than that of any other dairy breed, which taken together with the greater quantity, is a very important consideration to the owner. The fat globules in the Holstein milk are much smaller in size than in the milk of Jerseys, Guernseys or Ayrshires; hence will not float or rise so rapidly, which is an im-

portant consideration in shipping milk as it can be sent further without creaming and after cream has to some extent risen, the milk will bear mixing by stirring that other milk will not, and when thus stirred it resumes its normal condition without damage, which enables milkmen to serve their customers with milk nearly or quite uniform in richness, the bottom of the can being as good as the top. It must not be understood that the milk of the Holstein is deficient in butter fat, for such conclusions would be entirely erroneous; they stand at the head as being the greatest butter producers of the world, and placed side by side with other herds they will hold their own, herd for herd in butter yield and give a much larger and better byproduct than any of their competitors. Among the great records in America today the Holsteins both in number and in quantity of product hold rank with the best.

The great vitality of this breed has proved a safeguard against disease, as their resisting qualities are so great as to make them largely immune from tuberculosis and other dangerous diseases, and more simple ailments. This also enables them to bear their young when properly cared for almost entirely without loss or failure or danger of milk fever or exhaustion.

I have thus briefly and crudely drawn a vivid picture of the Holsteins as it appears to my mental vision after breeding them for years, handling and testing them in every way and observing the results in the community where I live; and the work and the results of other breeders, and the further my research goes the more firmly am I convinced that the Holsteins are the greatest dairy cattle in the world, and so firm is that conviction that nothing could induce me to change to any ther breed.

DISCUSSION.

The Chairman: It is the mission of the Dairymen's Association to help the dairymen all that it can; to help them to improve their stock and to encourage them to keep the best dairy cows. But it is not the purpose of the Dairymen's Association to help build up any one particular breed of cows. We know that there are many—as Mr. Fargo has said—there

are several different good dairy breeds, and we want every one free to use the breed which suits him the best and then he will do better by them every day and they will do better by him, than if he took a breed that he didn't take a fancy to.

What has been said about the pure bred sire is just right, it is just what we all have to do, and what I have to say about Mr. Fargo's paper is, if he had, every time he spoke of a Holstein, said "a good dairy cow" instead, it would have just suited me.

Now, this question is open for discussion, but I want to say on the start that I think it is better to rule out a discussion of the merits of the special breeds. I have seen such a discussion take possession of a meeting and there was nothing but war from that on all the way through. I think it would be well to discuss the effecet of using pure bred sires, just as the title of the paper suggests, but I do not think it best to champion any particular breed. The *dairy* cow, that is what we want.

Mr. Taylor: Mr. Chairman, in the discussion of dairying we want to make the dairy cow the center of our thought, that is, the dairyman and the dairy cow.

Now, the time has gone by for us to discuss anything but the dairy cow and the dairy man. I think that everything the gentleman has said in his advice regarding pure bred sires, is good. I am not in sympathy with any person breeding a pure bred dairy animal, standing before an audience and praising his own breed as standing above all others.

There are four main dairy breeds of cattle in the mind of a dairyman, who likes dairy cattle, and the breed that he likes best he will do better with than any other, the breed that receives his sympathy and his best effort. I think it is safe advice to advise the dairy men of Wisconsin to use a dairy bred sire of the breed he likes the best, the breed that receives his love, his his prejudices and his favor. I am in favor of that always. How do you suppose a Jersey cow would fare in the hands of a Holstein breeder, a man who likes Holstein cattle, or how do you think a Holstein cow would get along in a Jersey herd?

Sec'y Burchard: Down at your place, for instance.

Mr. Taylor: Down at my place. Don't you think she would be a little like a sinner in Heaven? Honestly, don't you think

she would be all out of place just as much as a sinner in Heaven?

Now, fellow dairymen, you are receiving the advice of men who want to do you good, that want to help you, and we think that we have got you switched off from the dual-purpose cow onto the line of the special dairy cow and we are perfectly willing that you should sail under your banner, under the flag that you have raised yourself. I wouldn't breed Holstein cattle if I liked Jersey cattle, simply because my neighbor does, and I wouldn't expect my neighbor to breed Jersey cattle because I do; no more than I would ask my Baptist friend to come over and join my church because there are more in my church than there are in his.

I am saying to you that you had better take a breed of cattle that you like best and then do the very best you can with them. There are seven thousand things that a good dairy cow is entitled to as a dairyman. You have a right to daily demand that the cows that you have put in your dairy shall be dairy bred cows. She has a right to demand that her offspring, the calf that is to take her place, shall be from a thoroughbred dairy sire.

But now, my fellow dairymen, I want you to understand that it is not all a matter of the breeding. There are a hundred thousand things that the cow has a right to demand of you as a cow owner, and best of all she has a right to demand a good home with a dairy man that likes that kind of a cow, and you have no right to put a cow in any other kind of a home. She has a right to demand of you that from start to finish of her living with you that you render unto her proper attention at the proper time that she may do her best work in the dairy.

This is a subject that is very close to my heart and life and I want to give to you what help I can in your dairy work. I don't want to becloud your vision, I want to encourage you to build up better herds, give them better attention, better barns, care for them at the proper time when they need attention, do as well as you can and I know that your financial interests will be advanced.

Mr. Glover: Mr. Chairman, I would like to supplement what Mr. Taylor has said by speaking a little further in regard to the selection of a sire.

It is not enough to choose a sire from the breed that you like

best, but it is also necessary to look into the ancestry of that animal that you are to buy. Because an animal is pure bred doesn't necessarily make him a good sire.

Mr. Taylor: It is better than a grade or scrub.

Mr. Glover: May be not. I have seen some grade sires that have been chosen for years and years for dairy purposes that I would rather have than some pure breds.

Mr. Everett: That is dangerous doctrine.

Sec'y Burchard: No, it is not.

Mr. Glover: I want to tell you, I have tested pure bred dairy cows for three years that didn't average 200 pounds of butter per cow.

Mr. Taylor: Did you test the dairy man?

Mr. Glover: Yes, I tested the dairy man. We not only want to like that particular breed, but we want to look back to their ancestry. It is time we raised ourselves above these notions and asked what kind of a mother did this sire have and her mother, his grandmother, as far back as you can reach.

I want every farmer to use a pure bred sire, but I want him, when he goes into a herd, to ask the man, "How much did his mother produce and her mother and her grandmother?" and so on back into the pedigree, through the record. When farmers begin to study a sire from that point they are not going to be very far wrong.

You take some of the animals that have been exhibited and won prizes at our shows. A few years ago a man sitting before me now was exhibiting a very fine cow from Wisconsin at the State Fair. There was a very practical judge passing upon it; the audience stood by the show ring and they saw that this beautiful cow did not receive any place at all, but that a rather inferior looking cow was put at the head. The same judge was passing through the barn that night and the owner of this cow was milking her, and the judge said to him, "Mr. Jones, is that the best cow you have on your place?" "No," he says, "that is my poorest cow, but she is a mighty good show cow." Those two men are here, the man who did the judging and the man that owned the cow. We want to do away with these things in our breeding up, we should be guided largely by the records,—just how much by the breed characteristics I am not able to say.

There is another thing of great importance, and that is the

power of producing young. In the work in Illinois these things came before me. Here are a hundred points we give to an animal on the score card. Well, we take into consideration her breed characteristics, her dairy conformation as it conforms to the standard outlined by some associations.

The question has been running over and over in my mind how much should we give to breed characteristics and how much to the power of the animal to produce butter and milk which is the ultimate end of all breeding, to get an animal of as high a power as possible to turn oats and bran into milk. Because she has a high, curved, pelvic arch you will not get milk for that. We do not keep cows to satisfy our fancy. A few rich people do but the rank and file of Wisconsin are keeping them for what butter fat they will produce.

Now, how much shall we give to the breed characteristics and how much to production and how much to the power of producing calves annually? We are placing too much emphasis upon breed characteristics, upon fancy points, but I am glad to see the breeders are facing right about, and they are making records; they are talking figures with records back of them, and the day is here when we are going to have, not only for a week, sixty days, but yearly records, and I offer these suggestions to the farmers that have not bought a pure bred sire and are going to do so. Go to the farmer who can show you the yearly record of his cows and pick your sires from his herd. I had rather have a sire out of a cow that I was sure would produce 300 pounds of fat in the year, than one out of a cow that would take first prize at our state fairs.

Prof. Emery: Mr. Glover, which gives the greater promise of certainly transmitting these dairy qualities, the pure bred sire or the grade sire?

Mr. Glover: Well, you of course are asking a very hard question.

Prof. Haecker: Other things being equal, the pure bred sire.

Mr. Glover: Yes, other things being equal, the pure bred sire. We should stick for the pure bred, don't go for the grade. When I said I would rather have a grade than some pure breds, I meant just what I have seen by traveling about six years among breeders of all kinds of dairy animals and making records of what they are doing. I took a pure bred herd of

dairy cows and in three years' time, raised them from 225 pounds of butter up to 306; by culling them out, and there was one pure bred cow in that record that never raised herself above 158 pounds of butter. Do you want a sire out of that mother? Or would you take it out from a mother that would make you four or five hundred pounds of butter?

Mr. Everett: You don't advise farmers to use grade sires?

Mr. Glover: No, I don't.

Mr. Everett: Particularly at this time when pure bred sires are so abundant.

Mr. Glover: No, I don't at all.

Mr. Taylor: You mean to say that some pure bred sires are not fit to breed to?

Mr. Glver: I say there don't enough of them go to the block and there are a few grades that are good ones.

Mr. Phillips: How are we going to find out whether they should be sent to the block?

Mr. Glover: If you found out that he had an inferior mother, a cow that produced, say, 150 pounds of butter, she was not a fit cow to use a sire from.

Prof.Emery: Then you would send that calf to the block?

Mr. Glover: Yes, I would if I were a breeder, for the advancement of the breed.

Sec'y Burchard: There is nothing that has so militated against the breeders of pure bred dairy cattle as the fact that they have sent out from their herds just that kind of stock, and when the common dairy farmer has got a bull from a pure bred sire and the dam actually only makes 150 pounds of butter and the farmer is using that sire on his common stock and finds that the calves produced are inferior to their mothers, as they are almost sure to be, he then very naturally becomes disgusted. Breeders of pure bred dairy cattle can do themselves and their stock no better service than to condemn mercilessly to the calf buyer every bull calf that does not come from a good producing cow.

A Member: I want to stand up and serenade what this young man said.

Mr. Hill: I want to serenade what Gen. Burchard said. This is a mutual admiration society, I guess; at any rate I want to emphasize a little further what Gen. Burchard said.

There is no question but what with many of the breeds,

their popularity for a time has been built up upon some fad of color or form or something else that has appealed to people rather than what ought to have appealed to them in dairy production.

Remember, we are talking about dairy cattle, that is, we have ruled out beef and the dual-purpose calf. There isn't anybody here to defend them, and I think we can congratulate ourselves on that more than anything else this afternoon.

Then, having ruled them out we ought to consider nothing else but how much butter fat a cow will produce in a year. A year ago, perhaps it would not have seemed wise for me to say that, but now all four dairy breeds are doing efficient work and you can go into any breed in Wisconsin and pick out a dairy sire from a breed that has been officially tested by the Wisconsin Experiment Station.

Another thing. Because some one breed may to-day be more popular than another breed—I can say this because the breed in which I am interested happens to be popular at this time and I think it works with other breeds, but as I was saying, because almost any—say, Guernsey bull—can be sold at this time at a good price, no doubt Guernsey bulls will be sold that ought to have their throats cut. Don't you go and buy a bull of a breed that is popular just because he is of that breed, when you can get a better bull of one of the other breeds for less money. Keep it in mind that it is a question of the production of butter fat, never let that get away from you when you go to buy a bull, no matter what the breed is.

Prof. Haecker: I have been greatly interested in this discussion and I want to heartily endorse what has been said here by those who have taken this advanced position in regard to the sires that are the offspring of cows only that do good work, sires from cows that have made records, and I think that we are today in a better position than we have ever been before; that the conscience of the breeder has been awakened as well as the conscience of the politician and that from now on there will be probably less unworthy male calves offered for sale, simply because they happen to have belonged to a certain breed and to be eligible to register.

It is rather a difficult matter for a breeder to kill a calf that he could turn off at a pretty good price, and sometimes I

think that there are some justifications in selling a calf that is really not up to the standard to a man who has very poor cows. Of course I wouldn't want to sell a bull calf—I wouldn't want to keep a thoroughbred cow that might not perform any better than the one Prof. Glover has referred to, but sometimes there are bulls that are not up to the standard, that we don't think are fit to sell for the use of a full blood herd, that yet would do a great deal of good in a scrub herd.

If I may diverge a little from the subject under discussion I want to say that I have a wholesome respect for a state that has held its own so remarkably well during a period when the trend seems to have been all in another direction in the surrounding states. You people who reside here in Wisconsin can have no idea of the strong current that was flowing from 1896-7 or along there, toward the use of the dual-purpose sire and the powerful forces that have been backing up that sort of doctrine. In fact, all the other states surrounding you have been swept over with this dual-purpose craze. I remember one of my colleagues writing an article in one of our agricultural papers and he boasted that the dual-purpose band wagon was sweeping over the great Mississippi from Winnepeg to the Gulf of Mexico, and I am sorry to say there was a good deal of truth in that, but when they came down here near Wisconsin, they found an established sentiment against this theory which had caused in Minnesota and Iowa and other places a great deal of destruction of dairy breeding and progress in dairy lines.

Now, that means a great deal to this state; it means millions of dollars per year that you have retained your dairy sires, that you have retained the idea of dairying with a dairy animal, and I want to locate the source of the powerfully potent forces that have been enabled to stem this tide in this state, and I say it finds its foundation in the influence of the Old Guard that first established this Association, and that influence has spoken through this Association and through Hoard's Dairyman and I might say through the dairy school, but I will have to omit that, but through other organizations that have been in public service in this state. The state of Wisconsin will never be able to give the due share of credit to those forces that have accomplished so much when the tide was running against the dairy cow.

The Chairman: We will have to close this discussion and go on with another subject.

Now, the summing up of this whole talk is this: Get a good, pure bred dairy sire, but be sure to get one that has good producing female ancestors. We will now hear the report of the committee on resolutions.

The following resolutions were read by Mr. Everett:

RESOLUTIONS ADOPTED AT THE WISCONSIN DAIRYMEN'S CONVENTION.

Mr. C. H. Everett, chairman of the Committee on Resolutions, submitted the following report which was approved by a rising vote:

Resolved, That we have been well received and entertained by the people of Tomah and vicinity; that the local committees have been diligent and painstaking in preparing for this convention; that we have had a splendid meeting and a good time; that we duly appreciate the many courtesies and kindly acts extended to us and express sincere thanks for the same. The banquet was splendid; the hospitality of the citizens of Tomah unsurpassed; we appreciate everything.

Resolved, That it is the sense of this convention that the Wisconin Dairymen's Association is warranted in using a large portion of its annual appropriation for the purpose of organizing self-supporting cow tests associations. The work of an extended test of the performance of individual cows wherever carried on has proved of immense value in weeding out inferior cows and educating cow owners.

WHEREAS, Under the present railroad rates in portions of this state, a local creamery paying a dollar a hundred to ship its butter to Chicago by express is competing at the same time with Chicago centralizers that secure rates on 40 per cent cream shipped as baggage at 26 cents per 100 lbs., cans returnturned free, thus enabling Chicago centralizer to obtain a transportation rate of 52 cents a hundred on their butter, while the local Wisconsin creamery must pay $1 per hundred to get its butter to Chicago by express, therefore be it

Resolved, That such discrimination in transportation charges by the railroad is not a square deal to Wisconsin local creameries, railroad companies and their patrons.

Resolved, That this discrimination in charges is a serious menace to the local creamery and the dairy industry of the state, and the officers of this association are hereby requested to urge this matter upon the Wisconsin Railroad Commission and the National Inter-state Commerce Commission for the purpose of securing justice in transportation to the Wisconsin local creameries and their patrons and that they secure the co-operation of the dairy and daily press in arousing and reporting the dairy sentiment of this state in the securing of equitable rates.

Resolved, That we fully appreciate the splendid work being done by Dairy and Food Commissioner Emery and his able corps of assistants in enforcing the laws strictly to the letter.

Resolved, That we deeply regret the loss of health to Professor W. A. Henry, which compels him to tender his resignation as Dean of the Wisconsin College of Agriculture, and Director of the Experiment Station.

Professor Henry has done a grand work for the farmers and dairymen of this state. He has been a man of great endurance and of fine executive ability, but has done too much, worked too hard and must now retire for a time to regain his strength. He is an ex-president of this Association and a member of its Executive Board. He has always been found with his shoulder to the wheel, pushing with all his might to elevate the standard of dairying and to bring more prosperity more comfort, more knowledge and more independence to the individual dairyman. He has always been a wise and safe counselor and we are pleased to know that he is not to retire permanently from his chosen field of work, and that we may have his advice and counsel for many years to come. The members of this Association, who have worked with Professor Henry for these many years, appreciate his worth to the agriculture of Wisconsin and regret that duty compels him to place the reins in other hands.

Resolved, That we have met with severe loss in the death of two distinguished and greatly beloved members and ex-presidents of this association, who have gone on before us into the sunshine of the future, since our last meeting.

No man can say too many good things about H. C. ("Cully") Adams and Stephen Favill. Mr. Adams was a remarkable man in many ways. He was far above the average

man in intellect, in debate, in judgment, in frankness, in kindness, in sympathy and in loyalty to his fellowman and to right principles. He was never known to do a mean thing or to commit a dishonorable act. His soul was large. He had a great big heart, full of tenderness for everyone. He was a big, broad man with a mental vision of great power. We all know of the splendid work he has done for this state and for the agriculture of the United States. We also know what he accomplished for the good of mankind during his short stay in Congress and in what esteem he was held by both houses of our national legislature and by President Roosevelt. He was a leader, so recognized by the brightest minds of our country, and lacked only physical strength to have made him one of the foremost men of the nation. There is not another "Cully" Adams, and there never can be, to the old members of this association. We loved him because of his honesty, his wisdom, his loyalty, his manliness, and his sweet, simple personality. We miss him at this meeting and we shall miss him greatly in the Executive Board, of which he was an honored and ever useful member. The place made vacant in this association and in our hearts by his untimely demise can not be filled now, nor do we want it to be. It is "Cully's" place and we shall keep it vacant until we meet him again.

Be it Resolved, That a copy of this resolution be sent Mr. Adams' family.

What can we say of that sweet old soul, Uncle Stephen Favill, who, though past 80 years of age and nearly blind when he died, was patient with all, still hopefully cheerful, and anxious for the welfare of Wisconsin dairymen? No man ever lived with a sweeter, more kindly disposition then he possessed. We have often seen him opposed in debate, but never saw him ruffled nor out of patience. He was always most charitable toward others and while he entertained most decided opinions, was ever ready to give way when satisfied that he was wrong. Although Mr. Favill was almost double the age of many members of this body, he was one of the boys just the same. He was so close to us, so entwined in our affections that we often called him Steve. He was always more like a young man than an old one. He was the oldest member of this association and one of its first presidents. His splendid work in building up the dairy industry of Wisconsin

will live on long after him and will stand as a monument to his skill, integrity and perseverance. His long active career has come to an end and he has passed on from this world of tribulations into a calm peaceful future. All we can say is "Good-bye, Uncle Steve, we will join you later."

Prof. Emery: I move that the resolutions relating to Mr. Adams and Mr. Favill be adopted by a rising vote.

Motion seconded and carried.

Said resolutions adopted by unanimous rising vote.

The rest of the report of the committee also adopted.

STABLE CONSTRUCTION AND SANITATION.

By E. L. Aderhold,

Dairy and Food Commission.

It would be an easy matter to demonstrate that the question of stable construction and sanitation has been badly ignored and in some respects, entirely misunderstood by the masses of milk producers.

In case we were to inspect a promiscuous lot of several dozen stables we might find a few that have fair ventilation, plenty of light, whitewashed walls and ceilings, sanitary floors, an absence of objectionable odors, and where clean cows are kept.

In most stables, however, we would find the ventilation very faulty, not enough light, cobwebs and dust overhead. in some we would find leaky, rotten floors, putrid soil underneath, strong odors and cows plastered with dung.

Milk produced under such conditions does not belong in the same class with milk which comes from clean cows in a sanitary, healthful stable.

The man who works in a tannery becomes so accustomed to the odor connected therewith that he fails to mind it. In a

like manner, he who daily works in a filthy stable may not appreciate the odors that prevail there.

The law requires that the stable shall be well lighted, well ventilated, not filthy, and the cows shall not be filthy. A penalty of $25.00 to $100.00 for each offense is provided for a violation of this law. Stable inspection will be in progress hereafter, so it behooves every dairyman to post himself on this question.

In discussing the subject assigned me I have no wish to go into details but merely to touch upon those features which insure to the cows comfort and cleanliness and which are conducive to healthfulness and productiveness.

CONTAMINATION OF STABLE AIR.

According to a certain experiment the weight was kept of the food and water consumed by a steer weighing 1600 pounds, also the weight of the solid and liquid manure voided and the gain in weight of the animal.

The weight of said voidings, plus the gain in weight, proved to be 49 pounds less in 24 hours than the weight of food and water consumed.

It was given out that this 49 pounds of food and water was discharged mostly from the lungs in the form of moisture and carbonic acid gas, nearly half of it being converted into carbonic acid gas.

When one animal will discharge so large an amount of impurities we must conclude that with a stable full of live stock the constant discharge of impurities amounts to considerable. To this must be added the odor arising from the dung.

Upon reflection it becomes at once apparent that if the stable air is to be kept comparatively pure it must be kept rapidly changing.

Carbonic acid gas is poisonous, is heavier than air, and settles to the floor. The coldest air also settles. In the upper layer we find the heat and purer air than at the floor.

VENTILATION.

The system of ventilation in use in many stables is an opening in the ceiling, with everything else closed during cold

weather. That system does not remove the foulest, coldest air; it does not provide good circulation at the floor where the cows breathe and throw their breath; it does remove the best air and the heat, and it demonstrates the ignorance of the masses on stable ventilation.

We should aim to have the air changing as rapidly as possible consistent with a sufficiently high temperature. Cows will not yield milk profitably if they are obliged to suffer from cold.

This picture illustrates the King system of ventilation, the principal features of which are that it removes the lower layer of air but does not permit the warm air to escape. In a well constructed stable this insures a rapid change of air without unduly lowering the temperature.

Outlet flues are built, usually of lumber, beginning eight or ten inches from the floor and extending higher than the ridge of the roof to insure a good draft at all times. When made of metal, ice is liable to form on the inner walls. One such flue is sufficient for a small or medium-sized stable, while a very large one would probably be better served with two flues some distance apart.

The proper capacity of the outlet flues is determined by the total weight of live stock in the stable, figuring one square foot of cross section inside for each 5000 pounds of live stock.

For instance, if the stock weighs about 20,000 pounds four square feet would be required, which could be furnished by one flue two feet square, or by two flues 12 by 24 inches each. Each flue should be provided with a damper for regulating the flow of air when a strong wind prevails. The lower layer of air at every part of the stable should have an opportunity to flow along the floor to an outlet flue. These flues may be placed where least in the way. If one happens to be placed close beside a cow she should be protected from draft by a partition several feet high and as long as the cow is.

INLET FLUES.

Fresh air is admitted through the small flues at the walls, which compels the air to travel upward about four feet where it is discharged at the ceiling where it meets the heat and becomes warmed. This arrangement prevents the warm air

from flowing out, inasmuch as it will not travel downward against the colder, heavier air outside. These inlet flues are usually four to five inches in diameter and are distributed on two or more sides of the building, say one every 10 to 15 feet. Where cows are facing away from the walls I think some of these flues should be extended along the ceiling so that they will discharge the fresh air directly over their heads.

At present I don't know how important the inlet flues are as I have seen apparently satisfactory results where only the outlet flues were used and I would urge every dairyman to install the latter and follow directions closely.

HEAT.

Heat in a stable represents food, so during the winter we can't afford to waste it. It should be utilized to the fullest extent in warming fresh air. It should not be permitted to flow, leak or be conducted out. That implies a tight ceiling, tight walls, perferably with one or more dead air spaces or some other good insulation.

LIGHT AND DISINFECTION.

Sunlight doesn't cost anything so we should not deny it to cows. The amount of window space recommended by the United States Department of Agriculture is six square feet per cow. Windows should be long, placed vertically, most of them perfectly on the south and east sides where they are protected from the coldest winds.

Whitewash is a most effective, inexpensive agent of sanitation and should be used about twice a year on ceiling walls and fixtures. It can best be applied with a spray pump. A little common salt added to the whitewash renders it less liable to rub off.

FLOOR.

The plank floor is now quite expensive, not durable and, as commonly laid, permits liquids to leak through into the soil, which becomes foul and from which gases rise upward into the stable. As a rule it is a decidedly unsanitary floor. Whenever a new floor is to be laid cement concrete should be

used by all means. Then there will be no leaking and no decay.

The stall floors may be overlaid with boards or plank. The pitch of the stall floor should not exceed half an inch from manger to gutter. The size of the gutter, according to some of our most progressive dairymen, should be eight inches deep by twenty inches wide. Others maintain that it is not necessary to have it so big. The passage back of the gutter should slope but slightly toward the gutter. It should have a rough surface to prevent slipperiness. The inner surface of the manger should be very smooth to facilitate cleaning.

Common decency, as well as the law, requires that cows be kept clean. It is not expected or necessary that farmers spend much time in cleaning them. The sensible thing is to provide stalls wherein cows cannot become filthy, and on this point some farmers will be obliged to do some studying otherwise they may get into trouble.

It should be made next to impossible for a cow to soil her bed. This result can be obtained by using such stalls as the "Thorp," "Howie," or the "Model" stall, and several others. The above named stalls, I understand, are not patented. The rigid stanchion should not be used because it is non-adjustable, and punishes the cow. An adjustable swing stanchion is now on the market and is considered worthy of attention and, by the way, I would suggest that almost any swing stanchion can be made adjustable by using an eight or ten inch plank flatwise at the bottom and one likewise at the top to fasten the ends of the stanchion on. With such an arrangement the stanchions need not be fastened in a line. They can be fastened long or short, according to the length of the respective cows.

It would seem advisable to have stalls of various lengths, rather than do all the adjusting at the front, especially where the manger is not movable. The mangers or gutter may be on the bias. Let the stall at one end of the row be four feet long and at the other end of the row, five feet long. The cows may thus be placed in stalls that nearly fit them. The fit can be made perfect by a little adjusting of the fasteners. Where stalls are separated by partitions the cow cannot step on and injure her neighbors udder. A box stall should be available at time of freshening.

The sprinkling of land plaster behind cows daily, as practiced by some of the most successful dairymen, tends to hold the ammonia in the manure, thereby preserving fertility and lessening contamination of the stable air.

Where horses and calves are kept in the same building with cows it is an advantage to have them partitioned off.

Where manure is kept in the barnyard it should, if possible, be piled up some distance away from the stable, so that cows don't need to wade through it.

Having provided sanitary, healthful, comfortable quarters such as every cow owner ought to have, the cows should not be left long outside on winter days. The stable keeps the cows warm provided the cows keep the stable warm. They can't do it if left outside too long.

DISCUSSION.

A Member: Would you make that outtake flue as large as 3 by 3 feet if the barn required it, rather than to make two flues?

Mr. Aderhold: Mr. Hoard has his outlet flue 3 by 3 feet and it certainly does good work. You will find some stables where they have high mangers or partitions which are high clear across and you can't expect that heavy, lower air to jump over that partition, and you have to have more than one in that case.

A Member: Would you take the air all from one place?

Mr. Aderhold: Run it clear down to the floor, just as you would a chimney.

Mr. Linse: Isn't it a fact that the outlet can be too large?

Mr. Aderhold: No; the trouble is that most of them are too small.

A Member: Would you advise having the cows face each other or otherwise?

Mr. Aderhold: I don't know that I want to give an opinion on that. The only criticism I have ever heard is that when they are facing the walls they face the light. Of course the question as to which is the most convenient for doing the work comes in. I am not particular about that.

A Member: I have those ventilating flues and I put them in the wall 6 inches by 10, I have four of them. They were intended to be 10 by 12, but they ran to the purlein and then had to be made smaller. Is that enough capacity, do you think?

Mr. Aderhold: I would rather run them full size, clear down.

A Member: How much stock would you calculate for that size? I have about thirty head.

Mr. Aderhold: Well, you have just about half enough ventilation.

A Member: They are twenty-eight feet apart on this side and I am calculating to put in an extra flue over the top there and carry it down in front of the mangers so there will be the same capacity below.

Mr. Aderhold: You are putting in a lot of lumber for the effect you are getting, I will tell you that. I think with less lumber and bigger flues you would have a great deal better effect.

The Member: The question with me is, how can I improve on it, having it the way I have, or had I better tear it out altogether?

Mr. Aderhold: Talk to me privately about that, and I will give you advice. I never would advise a man to follow the line of roof. If they come out at the purlein plate or the hip you can let them stick straight up sufficiently so that they clear the ridge of the roof rather than to follow the line. It is a good deal better and saves the expense of making those crooks.

A Member: Why is it necessary for the light to shine in the cows' faces?

Mr. Aderhold: It isn't for the light alone, but the fresh air comes in at the walls, and if some of those flues discharged right near, it might be some injury to the cows.

A Member: If you didn't care about having an alley wide enough to drive through, but simply to be able to clean out how wide would you make that alley?

Mr. Aderhold: I can't tell you that. My lecture has been along lines of sanitation, but of course you are supposed to have room enough to pass behind the cows easily.

Prof. Emery: This system, what we call the King system, for the ventilation of barns is very familiar to the teachers of

Wisconsin, particularly where they have had the old so-called Ruttan system of ventilation in the school houses, and I do hope that the encouraging of good ventilation in your barns will result finally in bringing about better ventilation in our school houses. By this system of ventilation, if you get that point you can adjust your means to the end, and the point I refer to is to ventilate by means of frequent change of air without creating cold currents upon the cows. I suppose the discussion will go on for a long time yet as to where the vilest air is in a barn. The vile air diffuses itself by what is called the principle of the diffusion of gases. The gas doesn't come and stay anywhere in one place, but when the gases come together they tend to diffuse, so that a heavy gas in the lower portion of a room does not remain there, but by a law that is well recognized diffuses itself throughout the room. You must consider gases somewhat different from liquids, but this, in one sense, is just like a pail of water reversed; this is the portion that is holding the gas down, and by the expansive force of the air due to heat is governed the pressure which causes this air to rise here; hence, you will see that you must have close walls and you must not have open windows, and in any system of ventilation we must recognize the necessity of having the walls thoroughly tight, except the opening where the air is admitted.

Now, if you keep in mind these few fundamental principles that animals, (to which class we belong,) God has made them with lungs for a certain purpose and the purpose of those lungs is to take in the oxygen in the air, and in these lungs the air comes in contact with the blood that is circulating through the body. The air passes through these membranes of the lungs into the blood, and the oxygen combining with the various impurities in the blood, purifies the blood. We can't help ourselves, we are made that way, and to husband life and health we need to do this and if we breathe an impure air, this carbonic acid gas that we exhale, if we breathe that for a short time we die; all animals must have good air. When you put your animals into a barn that is extremely close you put them into this vile air that is all the time tending to destroy the life.

This is a wonderfully interesting subject in so many of its phases, because the hope is that when we come to understand that it is worth dollars and cents to us in this way, we will

realize the necessity of ventilating our schoolhouses for our children.

There is one point that might help some people, and that is with reference to building crooked chutes. We know that the more elbows a stovepipe has, the harder it is to get the stove to draw; so it is with this ventilating flue, the more crooks and turns it has the less ventilation it provides and the straighter the flue is from top to bottom, the more ventilation you will get, because there is less friction.

ROBBER COWS—A DETECTIVE'S REPORT.

Inspector H. C. Searles, Fond du Lac.

Do Away With Robber Cows.

The establishing of Test Associations in Wisconsin will enable the dairymen to eliminate the unprofitable cows from their herds and help them to get better cows and make half the number do the same or even better work than the whole number of our average cows in Wisconsin are doing at the present time.

This fact may seem an absurd one to many, but this seems to be the case as it stands.

The milk scale and Babcock test must of necessity come into use. Every farmer should have a milk scale hanging in his barn where it will be handy to weigh each cow's milk and by the side of this a milk sheet with names or numbers of cows, enabling him to keep a daily record of the performance of each cow in his herd. There is not more than one in twenty farmers that know the amount of milk and butter fat each cow in their herd is producing per year. However, now is a good time for every dairyman to begin a more economical production of milk. It costs but a very little more to keep a cow that will produce 400 pounds fat per year than one producing 100 or less.

The most extravagant thing a dairyman can do is to head his herd with a scrub sire; this is a step back and a continual

slide as long as he continues such methods. There surely will be no advancement or grading up unless you have secured the best bred, most prepotent sire at the head of the herd that is obtainable. Improvement comes only through the superior qualities of the male used. Great damage is done breeders of high class dairy cattle by poor dairymen buying stock expecting to get something that will return a very large profit without much feed or care, and bad results are sure to follow. The poor dairyman says thoroughbred stock is too tender. Experience in my work shows that cows kept at a good profit to their owner are not allowed out of barn in winter more than one half to one hour per day in fine weather and are kept in warm, well lighted and well ventilated stables. They are watered in stable cold days and fed food of a succulent nature, such as ensilage or mangles, with all the alfalfa or clover hay they will consume without waste, and a balanced grain ration of not less than one pound to every three pounds of milk given.

Herd No. 1.

The following tables will convince the average dairyman that it pays to breed up and feed up their herds of dairy cows.

Herd No. 1 consists of eight grade Dur. and native cows.

No. lbs. of fat produced by herd in 9 monthes....	847.6 lbs.
Average amount of fat per cow	106 lbs.
Average amount of fat per month per cow	12.11 lbs.

Best cow in herd produced in 9 months 181 lbs. fat.
Four cows in herd range from 27.7 lbs. to 75.8 lbs.
Average test of herd 4.11.

Cows fresh from first of April to 1st. of May, test began in May. Cows showed lack of care in winter, having heavy coats of hair standing in all directions. They were milked at irregular periods, mornings from six to eight, and any time at night. They were turned in the yard after milked mornings and fed corn in the bundle, and the remainder of the day, ate at the straw stack, had free access to ice water and plenty of exercise, which the manager thought they needed in winter as well as in summer.

Herd 2.

Herd No. 2 consists of 20 grade Durham and native cows. Fresh in March and April.

Total number lbs. fat produced by herd for the period of nine months	2264.9 lbs.
Average amount fat produecd by each cow	113.24 lbs.
Average amount per month per cow	12.58 lbs.

Best cow in herd produced 171.1 lbs. in nine months. Six cows in herd range 23 to 70 lbs in the same period of time.

Average test of herd	3.97 lbs.

Herd in fair condition but not a dairy type. The manager called my attention to one cow saying, "That is my best cow in the barn, but she does not give as much milk as usual. I think her milk must be very rich, and will make up in fat what she loses in milk." He was very anxious to know the results of the test, and found to his disappointment that she tested 2.4. This cow produced 33.5 lbs. fat in nine months, and I think is in Chicago now, as she was sold to the stock buyer. Cows in yard a large portion of the day; fed corn in bundle, timothy hay and a small allowance of ground feed.

Herd No. 3.

Herd No. 3 consists of 15 natives said to be a little of every breed. This herd has a scrub sire at the head same as herds No. 1 and No. 2.

Total number lbs. fat produced by herd in 9 mos.	2246.9
Average amount of fat per cow	149.7 lbs.
Average amount of fat per month per cow	16.6 lbs.
Average of fat made by best cow in 9 mos.	217 lbs.
Amount of fat made by poorest cow	80.3 lbs.
Average test of herd	3.94 lbs.

Cows allowed one half day in yard or field for exercise. This dairyman has concluded he is on the wrong cow path, and will stick to one breed hereafter. He will secure for his use a thoroughbred sire and has made up his mind it does not pay to let his cows roam in the cold for exercise.

Herd No. 4.

Herd No. 4 consists of nine grade Jersies, Guernsies and two natives. Fresh in March and April; herd well wintered. Total number lbs. fat produced in 9 mo. 2377.2 lbs.

Average amount of fat per cow	264.13 lbs.
Average amount of fat per mo. per cow	29.34 lbs.
Amount of fat made by best cow in 9 mos.	345.1 lbs.
Amount of fat made by poorest cow	169.2 lbs.

The poorest cow being a native. Average test of herd 4.98.

Cows not allowed to shrink in milk when pasture became short in the fall, but were fed a forage crop at this period which is very essential, carrying them into winter quarters with a good flow of milk.

Cows watered twice a day and not allowed to stand out more than one half hour each time, and cold days they were watered in the barn. There is a thoroughbred sire at the head of this herd. There is silage and clover hay fed winters for roughage, with a liberal feed of gluten and bran. This herd of nine cows made 112.3 lbs. more fat than herd No. 2 consisting of 20 cows.

Herd No. 5.

Herd No. 5 consists of 19 grade Durham and native cows; fresh from March to May; cows in fair condition.

Total amt. of fat produced by herd in 9 mos. ..	1633.2 lbs.
Average amt of fat per cow in 9 mos.	102.07 lbs.
Average amount per month per cow	11.34 lbs.
Average fat produced by best cow in 9 mos.	169.1 lbs.
Amount of fat produced by poorest cow	91.6 lbs.

Eight cows in this herd range from 65.8 lbs. to 91.6 lbs.

Average teset	3.48 lbs.

This herd of 19 cows produced 744 lbs. less fat than herd No. 4 containing 9 cows.

Care of this herd: Cows well cared for, watered twice a day, fed silage, clover hay, oats and wheat ground, and bran equal parts by weight, but feeds the same ration to each cow regardless of the amount of milk given by same. Not a dairy type of cow.

I wish to speak of one patron that quit the work of having a yearly record kept of his herd. When I went to his home in the month of August he said "I have made up my mind to quit the test." I said, "Are you dissatisfied with my work?" "No," he said, "You are conducting your work all right, but I find I will have to cull out part of my cows, and I made up my mind if I continued I would have to cull them all out."

Herd No. 6.

Herd No. 6 consists of 17 cows, grade Guernsies.

Total amount of milk produced in one year ...	112,282 lbs.
Total amount of fat produced in one year	5205.64 lbs.
Average amount milk per cow	6722 lbs.
Average amount of fat per cow	306.03 lbs.
Cash receipts per cow	$76.83
Average test	4.62

A thoroughbred sire at the head of this herd. Herd well cared for. All winter milkers, not allowed out to drink over one half hour; fed silage and alfalfa hay; all they will eat up clean, also gluten and bran fed in proportion to amount of milk given.

Herd No. 7.

Consists of 12 cows—grade Jersies and Guernsies; freshening in Oct. and Nov. 1905 for year 1906 Produced.

Milk	77,227 lbs.
Fat	3352 lbs.
Cash	$869.45
Average milk per cow	6460 lbs.
Average amount of fat	279.38 lbs.
Receipts per cow	$72.45

A thoroughbred sire at the head of this herd.

DISCUSSION.

The Chairman: This paper shows up the great difference between cows, and it shows up the robber cows pretty well. Was this work done in this vicinity, Mr. Searles?

Mr. Searles: It was in Fond du Lac county.

The Chairman: So that the farmers who own these robber cows are not, many of them in the audience, probably because they are not the kind that will go clear across the state to go to a Dairymen's Association meeting.

Mr. Glover: Before a discussion of this subject, I want to confirm what Mr. Searles has said. In my work with the Experiment Station of the University of Illinois I found many, many, just such examples as he has cited this morning. It is almost beyond comprehension, the lack of intelligence regarding such conditions that exist. I have gone into many herds and had a man try to pick out his best cow, he has done so and at the end of the year I have shown him that his estimate must be reversed. He could see for himself that his best cow or what he thought was his best cow, was the poorest. The chairman is right in saying that the owners of these cows do not come out to conventions. I have in mind one man who split the end of his cow's tail and put a chunk of pork in to cure her when something was the matter with her. He was the kind of man that cut his hay only after it was ripe. I said to him, "Don't you know that you are locking up the nutriment in that hay in such a way that the cows will never be able to get it out, although it may be there?" But I kept after him and after I had tested his herd for two years, he came to me and he says "When you started coming to my place I had no faith in you, but your work has been a great revelation to me, and I have rereceived a lot of knowledge and I want to get some more," and he kept on asking me about this, that and the other thing. I found just such conditions as Mr. Searles has given.

A Member: It is the general impression among average farmers that it is too much work to keep account of the production of each cow. How did you find that, Mr. Searles? Does it take too much time and trouble, according to the people you meet?

Mr. Searles: Where the milk scale is handy and the milk sheet right there in place where they are passing with their

milk pails anyway, they can hang their pails on the scales and jot it down in a moment. At the end of the month they run up these figures, or I ran them up for them, and they have the satisfaction of knowing exactly what each cow is doing, and that satisfaction more than pays for the trouble.

Sec'y Burchard: And how many extra minutes to a cow does this extra labor require?

Mr. Searles: It wouldn't take over one-eighth of a minute.

Mr. Goodrich: I have kept time on my boys—I had a great deal rather hold the watch on some one else when they work than work myself, I was always that way,—and they didn't know that I was timing them, you know. It took one fifth of a minute to put down the record, it averaged 12 seconds. I have known men to send their boys to college and spend thousand of dollars to get them through, and when they got through they didn't know so much as a boy that would spend twelve seconds a day to weigh the milk of the old brindle cow. It has waked him up, giving him something to think about.

Mr. Searles: Out of the twenty-six herds that I visited, two thirds of the owners are weighing and keeping daily records of their herds today, and I have not urged them much either. Indeed, I have asked a number of them, "Would you go back to the old way?" and they said, "No, I want to know what my cows are doing."

Sec'y Burchard: I think perhaps a little corporation glorification ought to come in here. Mr. Searles has been in the employ of the Dairy Association doing this work under instruction from the Executive Board, and you can see that the Association is trying to do something besides coming up to Tomah and having a good time.

Mr. Aderhold: It is really remarkable how few dairymen are keeping records of individual cows and know what they are earning, to say nothing about the cost of feeding them. Several years ago, during one season I held something like forty to sixty cheese factory meetings. I was talking a little along this line and had a chart, and I always asked the audience how many there were there that knew what each cow in their herd earned for the year. I would ask them to raise their hands, and there was only one out of all those audiences that I got the raise of one hand from. I asked him "How many cows have you " and he said, "Only one."

Mr. Hill: I think there ought to be a still further comparison of those figures,—one hundred and two pounds of butter fat in nine months for a herd of twenty cows and on the other hand a herd that produced just six times that. Taking these figures with those that Mr. Wyatt has brought up for the production of the herds here, I am wondering if there are some of these farmers in this audience whose herds average 102 pounds of butter per year and if there are such I hope that somebody is going to get enough inspiration, after having come perhaps six or eight miles to our association and having heard what other cows are doing, that he will at least find out what kind of cows he is keeping by weighing and testing his milk, and before long that he will quit breeding such cows, and like some others that we have heard of here, he may find that after two years of hard work and dairy thinking he can receive something like seventy dollars per cow instead of boarding her for next to nothing. Mr. Searles found some cows that were making 33 pounds of butter in nine months. I had occasion to talk with a man in our vicinity the other day and he told me that he had come to the point where he had concluded to get rid of several of his cows and buy a few grade heifers and start anew.

Prof. Emery: There was one phase of the subject under discussion this morning that ought not to go completely by default. It was stated very emphatically that a breeder of pure bred cattle should not send out sires that are unworthy. I think that is a very wholesome doctrine, but this is a fact that I would like to have come out in connection with that; that the breeder of pure bred dairy cattle cannot live entirely upon the basis of being a philanthropist, and he cannot kill off in his herd that inferior stock and then sell his superior animals at the prices of scrub or grade. Every breeder knows that he is beset with customers asking for pure bred sires at a price that no good breeder can possibly make a living at, and if dairymen are to have good dairy sires they must expect to pay a reasonable price for such an animal.

A Member: I think it is the experience of all breeders that the average farmer will pick the cheaper animal every time.

Mr. Hill: On the other hand; the best dairymen will buy the best, regardless of the price.

Report of Treasurer H. K. Loomis received and filed.

TREASURER'S REPORT FOR 1906.

Mr. President and Members of the Association: The following itemized report is made showing the source from which all moneys paid into the Treasurer's hands were received and the disbursements paid on orders from the Secretary which I hold as vouchers.

Receipts.

Feb. 6.	Amount in hands of treasurer	$345 44	
	Memberships	27 00	
	Memberships	166 54	
	From sale Keilismeier cheese	3 82	
May 5.	From state treasurer	1,000 00	
Aug. 4.	From state treasurer	2,000 00	
1907.			
Feb. 20.	From membership	6 00	
			$3,848 80

Disbursements.

Feb. 6.	H. K. Loomis as per Sect. order	$201 50	
	C. P. Goodrich, taking cow census	75 00	
	H. K. Loomis and assistant, expenses to convention	14 49	
7.	Fred Rietbrock, premium on butter	15 00	
	John E. Baltchner, premium on butter	14 16	
	W. F. Hyne, premium on butter	11 80	
	Louis G. Heimerl, premium on butter	15 00	
	A. G. Puerner, premium on butter	9 44	
	W. F. Krohn, premium on butter	9 44	
	C. A. Paddock, premium on butter	14 16	
	Murphy Bros., premium on butter	4 72	
	C. H. Wild, premium on butter	4 72	
	Otto Keilismeier, premium on cheese	15 00	
	Axel Bruhn, premium on cheese	11 80	
March 9.	H. C. Searles, inspector	124 86	
	Pro. H. L. Russell, expenses Waukesha convention	3 90	
	C. P. Goodrich, expenses Waukesha convention	2 30	
24.	H. K. Loomis, expenses attending executive committee meeting	7 98	

Mar. 27.	John Widmann, expenses Waukesha convention	$1 96	
Apr. 7.	H. C. Searles, inspector	136 60	
May 2.	H. C. Searles, inspector	127 80	
	C H. Everett, expenses attending ex. com. meeting, March 22nd	7 88	
16.	Peter Zumkehr, inspector	125 00	
26.	W. A. Henry, expenses attending Waukesha convention	4 50	
	Mrs. A. L. Kelly, reporter	106 00	
June 7.	H. C. Searles, inspector	123 00	
	Peter Zumkehr, inspector	140 00	
	Cornish, Curtis & Green, milk tester	41 19	1,369 20
July 5.	John Luchsinger, legal services and expenses	50 00	
	Peter Zumkehr, inspector	137 00	
	Fond du Lac Blank Book Co., printing blanks	9 00	
	H. C. Searles, inspector	103 15	
Aug. 10.	Cornish, Curtis & Green, supplies	11 10	
	H. C. Searles, inspector	101 90	
	H. C. Loomis, inspector	72 96	
	Peter Zumkehr, inspector	130 00.	
Sept. 10.	Peter Zumkehr, inspector	135 00	
	H. C. Searles, inspector	102 90	
	H. K. Loomis, inspector	60 94	
Oct. 12.	H. K. Loomis, inspector	69 69	
	H. C. Searles, inspector	101 00	
	Peter Zumkehr, inspector	120 05	
Nov. 18.	Peter Zumkehr, inspector	137 00	
	H. K. Loomis, inspector	55 00	
	H. C. Searles, inspector	104 35	
Dec. 12.	H. C. Searles, inspector	102 35	
	Fond du Lac Blank Book Co	9 50	
20.	H. K. Loomis, inspector	55 00	
31.	Henry Elmer, printing report, premiums, etc	82 29	
1907.			
Jan. 14.	H. C. Searles, inspector	104 25	
	H. K. Loomis, inspector	56 51	
	Chas. Linse, expenses Waukesha cons	11 14	
8.	H. K. Loomis, inspector	50 00	
	H. C. Searles, inspector	104 35	

Mar. 26.	W. D. Hoard Co., printing.....	$25 40	
	Geo. W. Burchard, salary and expenses.	344 10	
Mar. 6.	H. K. Loomis, postage for three years ..	4 63	
	Chas. L. Hill, expenses, 1906.....	20 97	
	Balance in hands treasurer	8 12	
			$3,848 80

Chairman Goodrich: The time has come for us to close this convention. We have had a good time, but all good times have to come to an end. I have been several times to Tomah, and each time I come here I like it better than I did the previous time. When I came here fifty-one years ago, there were not more than one or two farmers in this part of the country, but I was greeted heartily and urged to stay. The next time I came, I attended a Farmers' Institute and I was used still better, and this time is the best of all.

Now, I will call on General Burchard to give the benediction.

Sec'y Burchard: My opinion is we don't need any benediction here. The truth of the matter is, of course, that the Secretary, being a sort of executive officer of the board, has a good deal to do in arranging the program and getting ready, and I wish to express my very great satisfaction with the work of my hands on this occasion. It has turned out quite as well as I had any reason to expect that it would. I want to say further, however, that that is not due to me, nor is it due altogether to the men who have been on the program, but a very great proportion of the merit is due to the audience that we have had. Those of us who sometimes try to speak in public know very well that there are two kinds of audiences, one is a cold audience and the other is a warm audience; one is a responsive audience, the other a non-responsive audience,—you speak your words and they seems to come back to you and that doesn't give a man very much energy, it doesn't prompt him to say his best things. The other kind of audience seems to draw your thoughts and your words out of you, and it is a pleasure to speak to them, and that is what makes a good convention, and I beg to say that I think the success of this convention, if it has been a success, is due quite as much, if not

more, to the audience than to the Secretary who arranged the program, or to the gentlemen who have read papers, and answered your questions.

I do not think it remains with me to say anything more. I believe you know that we are greatly obliged to you and if we leave with you, those of us who are strangers, as good a flavor of ourselves as we carry away with us of you—flavor is a distinctive thing in dairying, you know—I think we will all be satisfied.

The Chairman: This convention is adjourned until the next time.

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THIRTY-SIXTH ANNUAL REPORT

OF THE

WISCONSIN
Dairymen's Association

HELD AT

Monroe, Wis., March 11, 12 and 13, 1908.

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

COMPILED BY
A. J. GLOVER, Secretary.

MRS. A. L. KELLY, Stenographic Reporter.

MADISON
DEMOCRAT PRINTING COMPANY, STATE PRINTER.
1908

LETTER OF TRANSMITTAL.

WISCONSIN DAIRYMEN'S ASSOCIATION,

Secretary's Office,

FORT ATKINSON, June 30, 1908.

To His Excellency, JAMES O. DAVIDSON,

Governor of the State of Wisconsin.

DEAR SIR—I have the honor to submit for publication, as provided by law, the Thirty-Sixth Annual Report of the Wisconsin Dairymen's Association, showing the receipts and disbursements during the past year, also papers relating to the dairy interests read and discussions had at the annual convention held at Monroe.

Very respectfully,

A. J. GLOVER,

Secretary.

OFFICERS.

PRESIDENT,
F. H. SCRIBNER,
ROSENDALE, FOND DU LAC COUNTY.

VICE PRESIDENT,
A. D. DELAND, SHEBOYGAN, SHEBOYGAN COUNTY,
President 1877.

W. A. HENRY, MADISON, DANE COUNTY,
President 1890.

W. D. HOARD, FORT ATKINSON, JEFFERSON COUNTY,
President 1891-3.

C. H. EVERETT, RACINE, RACINE COUNTY,
President 1894-5.

G. W. BURCHARD, FORT ATKINSON, JEFFERSON COUNTY,
President 1896-7.

H. C. TAYLOR, ORFORDVILLE, ROCK COUNTY,
President 1898-9.

C. P. GOODRICH, FORT ATKINSON, WIS.,
President 1900-1.

J. Q. EMERY, ALBION, WIS.,
President 1901-3.

CHARLES L. HILL, ROSENDALE, FOND DU LAC COUNTY,
President 1904-5.

W. J. GILLETT, ROSENDALE, FOND DU LAC COUNTY,
President 1906-7.

SECRETARY,
A. J. GLOVER,
FORT ATKINSON, JEFFERSON COUNTY.

TREASURER,
H. K. LOOMIS,
SHEBOYGAN FALLS, SHEBOYGAN COUNTY.

CHESTER HAZEN, RIPON, FOND DU LAC COUNTY,
President 1872-74. Died 1900.

HIRAM SMITH, SHEBOYGAN COUNTY,
President 1875-76. Died May 15, 1890.

H. F. DOUSMAN, WAUKESHA COUNTY,
President 1878.

Z. G. SIMMONS, KENOSHA COUNTY,
President 1879.

C. R. BEACH, WALWORTH COUNTY,
President 1881-82. Died September 15, 1896.

W. H. MORRISON, WALWORTH COUNTY.
President 1883-86. Died December 15, 1893.

H. C. ADAMS, DANE COUNTY,
President 1887-89. Died July 7, 1906.

STEPHEN FAVILL, DANE COUNTY,
President 1886. Died —, 1906.

ARTICLES OF ASSOCIATION.

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

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

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

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

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

ARTICLE VI. The regular annual meeting of the association shall be held each year, at such place as the executive board shall designate.

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

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

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

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

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Dairymen's Association

AT THEIR

THIRTY-SIXTH ANNUAL CONVENTION

Held in Monroe, March 11, 12, and 13, 1908.

President W. J. Gillett in the chair.

The Chairman: In the absence of the mayor of this city, Mr. Phineas W. Clawsen will present a few remarks at this time.

ADDRESS OF WELCOME.

Mr. Chairman, Ladies and Gentlemen: I never was more surprised than I was a few minutes ago when I was requested to fill the place of the mayor, but it would be strange if we could not bid you a hearty welcome to this little city of Monroe, anybody could do that. Indeed, you are more than welcome.

Gentlemen, you are engaged in a great work, the dairy interests of this state. I was deeply interested in that business at

an early period of my life, but in proper time I was weaned and lost my interest temporarily, at least.

We have in this county as you are well aware, very large dairy interests which have been a source of great revenue. I presume that no sixteen mile square in the state of Wisconsin can show as many cows and as large dairy interests as we can in Green county, largely in the hands of the Swiss-Americans.

Gentlemen, there are only a few of you here, but where there are a few earnest men engaged in a good cause, there is nothing to fear. I trust your sessions will be profitable and result in great good to this community, and I trust that the community will show its appreciation by its attendance. I trust your exercises will be satisfactory and agreeable, and again giving you the most hearty welcome on behalf of the city and speaking for the mayor who is out of the city, I bid you welcome. If I knew where the keys of the city are, I would present them to you; I do not know where they are, but I think Governor Hoard will find them if anybody can.

RESPONSE.

CHARLES L. HILL, Rosendale.

Mr. President, Mr. Clawsen, speaking on behalf of the city of Monroe and Green county, and Gentlemen: It gives me great pleasure to respond to this address of welcome given by Mr. Clawsen of this ctiy. It is indeed a great pleasure to me personally, and I am sure it is to those who have been previously interested in this Dairymen's Association to once a year gather in this annual meeting.

We come to Green county realizing that we are in one of the pioneer dairy sections of this state. Driven perhaps to dairying, the citizens of this part of the state, because of the rather rough character of the land as compared with some of the parts of the state, it proved to be their salvation.

I note on the back of this program that the banks of the city

of Monroe have upon deposit, $1,800,000 of farmers' money, probably pretty nearly all derived from milking the old cow, and that in other banks of Green county there are deposited a million and a half dollars of these same farmers' money.

In some other section of the state, older sections than this, where the land was more nearly level, they proceeded at once to raise grain and they did it because they could easier gain a livelihood upon that kind of land, but later on it became necessary in those sections of the state and of other states to do something to bring back the fertility of the soil which had been sold out by the bushel to feed the inhabitants of Europe with white flour. They were wise enough to turn to the cow, and nobly did she respond, and if the cow has responded to the demands of Green county, as we know she has, she stands ready to respond for every other one of the counties of the state.

Wisconsin, I believe, stands second only to New York in the value of its dairy products, and of all the states of the Union, if she stands second now, she must stand first some day because of the large amount of undeveloped territory that is in the northern part of the state, to say nothing of the year by year increase of the dairy business in these southern counties.

It was my pleasure to spend nearly all the month of January in New York state, and comparing that state with our own, I see that the dairy sections of that state were first driven into dairying as was this section of this state, because of the rough character of the land, but that we have the advantage of them in this race for supremacy in the dairy industry, because of the fact that we have yet so much undeveloped territory that is bound to be some of the very best of the dairy sections of the state. We have with us at this time, I am glad to see, some farmers who have come from the far northwestern part of the state in the hope that they will gain for that section of the state the next meeting of this Association, and I must say, from recent visits in that part of the state, that my sympathies are with them, and I hope that they will be given the next year's meeting of this Association there.

There are also with us dairymen from Illinois on the south and Minnesota on the north—we ordinarily speak of Minnesota

on the west, but in this case the men who come here to enjoy these sessions with us are from the northernmost part of Minnesota, and they too are interested in the development of the dairy industry in the northern part of Minnesota, and doubtless, when they go from this state to their own state, they will tell their people, as I am telling you, that Wisconsin won't be in it when Minnesota has developed her dairy industry.

But perhaps I am wandering from the subject. I want to thank Mr. Clawsen for his welcome to us here. I am sure we all come here not as instructors, but as learners. If any person is so well posted on any business that he cannot go into a meeting and learn something that he did not know before, he is in a hopless condition, and the more a man knows to begin with, the more readily he learns from his fellow man, and I hope we are going to learn much from the men who will later on be here. These dairymen of Green county, who have built these fine houses and great, large, red barns, could undoubtedly tell us very much of the things that tend to the prosperity of the people. It has impressed me this year as never before, because in the fall I took a daylight ride across the state of Missouri, from Kansas City to St. Louis, without practically seeing any buildings that would be considered buildings in Green county, until you get within a few miles of St. Louis where you will see some fine big barns and some good alfalfa.

Now, without taking more time, I will repeat the thanks of this Association to Mr. Clawsen and the city of Monroe for this welcome.

C. H. Everett, Racine.

Mr. President: It is a pretty hard matter for me to talk to anything but an audience of farmers, and these gentlemen here are nearly all professional farmers, and this is a pretty hard place to put an old hayseed who can't talk anything but cows, silage, etc.

I have been to Green county a good many times in Farmers' Institutes and other kindred meetings, and have always met with

a warm reception, especially in the city of Monroe, and we all like to come here; you have a lot of good people in this county and in this city, warm-hearted, hospitable entertainers.

I like to meet and hope to meet at this meeting the dairy farmers of this vicinity.

This is a milk producers' convention; it is not a cheesemakers' convention or a buttermakers' convention, properly speaking, but a meeting for the dairy farmer, for the milk producer; he is the man we want to get at and that we hope will be here before the final adjournment of this meeting. We want to talk to him about the kind of cows he is keeping; we want to ask him how much he is getting for the feed that he is selling to those cows; we want to make him understand, if possible, the value of thought, the value of thinking, and that is the trouble with the Wisconsin dairyman, he doesn't think, he doesn't seem to reason and think out the problems that are capable of being solved.

Uncle Theodore Lewis was known to some of you who are present, the hog breeder of Dunn county, a plain German farmer, but a man who was wiser than his generation. I once heard him say at a Farmers' Institute in Minnesota that the higher we climb, the more extended the horizon, and the more we study the more we come to understand something about our ignorance. So the problem for the farmer is to think more, is to come to know the truth about a dairy cow, and about the proper feed for her, how to feed her so as to get highest price for the products grown upon the farm. I am reminded of a little story which is a true one. This happened in the Wisconsin legislature last winter at Madison and I happen to know of the facts. In that legislature was a man by the name of Reynolds, from Door county, a hard headed Scotch farmer, a man without education only as he had educated himself, by reading and thinking, but a man who was always seeking truth and who had been successful in finding it in his business as a farmer.

There was a bill introduced in the legislature by a member from Pepin county who had the floor in advocacy of this measure. Something in the bill didn't suit our friend Reynolds, and he objected to the bill, winding up his little speech by saying, "I am agin the bill." Our friend from Pepin county took of-

fense and twitted the old Scotch farmer with being an uneducated, and illiterate man. Mr. Reynolds immediately rose to his feet and said, "The gentleman thinks that I am uneducated. Well, now I am going to tell you how I got my education. I went into Door county a good many years ago, took my axe and went into the woods and commenced to chop out a home and when I got tired, I would sit down on a log and read. I always had a book with me and I would read until I got rested, and then I would chop again, and then I would sit down and read and then I would think, and that is more than my friend from Pepin has done."

It is thinking that brings a man success.

The President of this Association is the owner of a cow—a lot of cows, but one cow in particular. She has just completed a year's test. The name of this cow is Colantha 4th's Johanna. She is a Holstein. She produced in one year 998.26 pounds of butter fat, or the equivalent of about 1,164 pounds of butter, she produced in that year over 27,000 pounds of milk.

If you look at the President of this Association, you don't see anything remarkable about him, he isn't as good looking as either Burchard or I, but he must have applied some thought to that cow and her product. Mr. Gillett is a man who thinks and reasons and studies.

We have got another cow, a three and a half-year-old Guernsey up in Marathon county and she produced 603 pounds of butter fat, over 700 pounds of butter as a three and a half-year-old, and is quite evident to all of us that the owner of that heifer was a man who thought, a man who studied the proposition of dairying all along down the line.

That to me seems to be the only way to solve the problem of dairying.

You all know about these things, but I am sorry to say it is the farmer who is not here and who is not willing to get ahold of these facts that needs this kind of a meeting. He is not willing to apply himself.

A Racine county dairyman came into my office the other day; he thought he was not getting as good results as he should from his cows, and he didn't know how to do better. I said to him,

"You are in the right frame of mind, I am glad you came in." I asked if he had tested his cows and he said, "No, I hadn't thought of that," and he hadn't thought of a thousand and one things that every man ought to think of to try to help himself as a dairyman.

Mr. Clawsen: A thought has occurred to me. Twenty-seven thousand pounds is a good deal of milk for one cow, and I simply want to suggest that we have a very fine Ananias Club here in the city of Monroe and I am president of it, self-elected, and I would be glad to be of service to any of you gentlemen who want to get into our club.

Secretary Burchard: I have no doubt our friend is well qualified to preside over such a club.

ANNUAL ADDRESS OF PRESIDENT.

W. J. GILLETT, Rosendale, Wis.

Members of the Wisconsin Dairymen's Association, Ladies and Gentlemen: Again we are reminded that another year has been added to the life of the Wisconsin Dairymen's Association, and I take pleasure today in greeting you at the opening of this, our thirty-sixth annual convention.

The past year has been one of continued prosperity on the part of the dairy husbandman of Wisconsin and elsewhere. The industrial condition of this great commonwealth has been such as to stimulate the demand for dairy products, and this demand has stimulated prices to the extent that it has made a good margin of profit for the producer possible.

Whether the recent financial disturbance will continue to depress the business affairs of this country, is a matter for serious consideration and I can not suppress the thought that we have for a time at least, reached the top and that it behooves our dairy farmers to guard well the avenue through which leakage is most liable to occur.

In any event, the time was never known in this country, when

a herd of good cows, properly fed and judiciously managed, did not compensate its owner well for the feed, time and labor expended, and it is safe to say that we have passed through contingencies that are not liable to be repeated in the near future.

According to statistics for the year 1905, fifty-seven million dollars represent the annual revenue for dairy products supplied by 944,000 Wisconsin cows. From this we can form some conception of the importance of our dairy industry to the resources of the state.

Wisconsin today ranks first among the states of this Union in the total aggregate for butter; second only to the great state of New York in the total aggregate for cheese; and second only to the Empire state in the total aggregate of all dairy products and by-products. Such is the evidence for determining the rank of our dairy industry among the states of this nation.

According to statistics for the year 1906, nearly three hundred and forty-nine thousand Wisconsin cows supplied milk to cheese factories, for which the owners received, not considering the value of by-products, $13,907,600, or an average of about $39 per cow per annum. More than five hundred and sixty-four thousand Wisconsin cows supplied milk for creameries, from which was made 101,059,394 pounds butter, bringing a cash return, not counting the value of by-products, of $22,058,346, thus showing an average yearly production of 179 pounds butter per cow and an average gross return of about $39 per cow per year.

I cannot refrain from calling attention to the average earning capacity of our cows under prevailing Wisconsin conditions. A large number of herds within our borders are showing a yearly average of 300 to 400 pounds of butter per cow per year, in fact, many are even surpassing these figures, which would indicate an average earning capacity of $100 or more per cow in many instances. What then, must be the conditions under which many of the cowkeepers of the state are laboring, that the average is reduced to 179 pounds butter per cow, or to an average earning of $39 per year? To the owner, what must be the loss occasioned by many animals that are allowed to live in the guise of the profitable dairy cow?

It would seem that prevailing conditions in many herds, and the animals used for dairy purposes, are but burlesques to the dairy business.

While the state of Wisconsin ranks high among the dairy states of this nation, and while the average producing capacity of her animals maintained for dairy purposes is second to those of no state in the Union, still there is much room for improvement, and a broad field for our missionaries among the cowkeepers of the state.

For the purpose of comparison, and as an illustration of the possibilities in breeding, development, care and feeding of the dairy cows, you will pardon me for mentioning the performance of a cow in our state, that recently completed an authenticated yearly record of 27,432 pounds of milk, containing 998 pounds of butterfat or the equivalent of 1,164 pounds marketable butter. The actual return from the milk of this cow delivered to a cheese factory, aside from the value of the by-product, was $329.13, or more than eight times the annual earning of the average Wisconsin cow, while the quantity of butter which could have been made from the fat she produced, was more than six times the amount produced by the average cow, omitting the proportionate increase in the value of her by-product.

The results that are possible for one man to accomplish, are always possible and within reach of his neighbor under the right conditions.

Of course, we never expect to see many cows produce 1,000 pounds of butterfat per year, but it would seem that, by better breeding, better feeding and caretaking, deeper thought, and a wider observation of cause and effect, we might reasonably expect to double the producing capacity of the average Wisconsin cow.

In this great race of life, it is a lamentable fact, but nevertheless true, that the accumulation of money or the greed of gain, is the underlying force that prompts the average man to action, and there is perhaps no argument that will appeal to him quicker than one convincing him of the drainage by which his finances are being sapped.

There are many cowkeepers who are, to a greater or less ex-

tent, blind to their own financial upbuilding, resulting from a lack of knowledge and a keener appreciation of the principles that lead to progression. Many are overworked by manual exertion and neglect the more important part of allowing the brain to solve problems that would lighten the burden of the weary hands. Our most successful dairymen and our best breeders are those whose minds as well as muscles have been engaged in the execution of their business engagements.

There is little hope for him who settles down in his own shadow, content with his own accomplishments; for it is discontent that prompts us to try to climb higher. He who does well will aspire to do better, and he who does better is sure to try for further improvement.

Some were born to lead, while others never advance under any conditions. Some were born to succeed, while others never rise above a certain level. We can not all lead, but we can all follow and we can all succeed.

The spirit of aggression often leads to progression, and there is always hope for him who is willing and anxious to be taught.

What we need in our rural districts and for a further uplifting of our dairy husbandman is more education, more light, and a deeper, broader and keener knowledge of the forces that stimulate improvement and progress.

The subject of profitable dairying and its emoluments is broader and deeper than some of us realize, and the science of breeding, the art of feeding, and a favorable environment, are among the more important factors that contribute to success and enter into this great cow race.

The dairy cow is no financial support to the ignorant, shiftless man, who is indifferent to her individual characteristics and maternal instincts.

The solution of this great proposition lies in a wiser selection of our breeding animals, better caretaking and more liberal and intelligent use of feeds.

It is no speculation or experimentation, but as sure as the laws of gravitation, and by him who realizes these things and acts accordingly, we may expect the standard of excellence to be con-

tinually improved, and by him who is negligent of and indifferent to them, the average will never be raised.

In the approved pure bred sire lies the foundation for upbuilding and the salvation for future live stock improvement, and the sooner our dairy farmers appreciate this fact, the sooner will there arise, through a medium of a better class of animals, the spirit for successful advancement and the temptation for better management; hence, the adoption of wiser methods that will materially affect prevailing conditions, and tend to raise the standard of excellence of the Wisconsin cow, which will continue to contribute, and more liberally, to the great resources of the state.

The present prevailing prices of feed stuffs have been such as to make our dairy rations very expensive, without any proportionate advance in the price of dairy products. Such conditions of course cut down the margin of profit for the producer, and yet it seems advisable to recommend the liberal use of proper rations, in the hope that present conditions will not long continue, and that our herds may be kept in condition to respond at any future time.

I am pleased to report that the agents of this Association in the field have been doing work which I am sure will prove of lasting benefit to those with whom they have been associated and to those who have manifested an interest in their own advancement. Several test associations have been organized in different sections of the state, many of which now stand and flourish upon foundations of their own, and which can but serve as educators to those who have become identified with them for the purpose of a better acquaintance with their own conditions and the existing relation between feed and cost or economy of production.

Our Dairymen's Association stands as an exponent of the dairy cow of Wisconsin and our dairy interests. Its membership is made up of our most thrifty and influential dairy farmers; men who love the farm and the animals that have contributed to their happiness, and made farm life congenial and profitable; men who have distinguished themselves as practical farmers, practical breeders, practical feeders, and practical

dairymen, and to whom Wisconsin owes a lasting debt of gratitude for the energy and skill they have exercised in their own business operations, thus making of themselves living examples for the uplifting of Wisconsin's dairy industry.

The future enterprise of our state lies with the young men of today, and it is an inspiration to note that our average young man on the farm, is starting out in his business career with a deeper appreciation of better breeding, a wider knowledge of feeds and feeding, and a better understanding of caretaking and favorable environment. Our past is at least secure; our present reflects much credit upon us as a dairy state; and, by our young men on the farm, let us hope that, in the not far distant future, the average producing capacity of the Wisconsin dairy cow may be doubled.

In closing, permit me to extend to the dairymen of the state, most hearty congratulations upon achievements already secure, as well as upon the most auspicious outlook.

To the members of this Association and others, I wish to express my deepest sense of appreciation and gratitude for the courtesy and kindly consideration that has been invariably extended to me during my terms as your president.

I have done but little for you and regret that I have been unable to do more, but on the transfer to my successor of the Association's official gavel I shall willingly and gladly surrender to him the honor and authority which for the past two years has been reposed in me as chief magistrate of this Association.

Governor Hoard: If a few remarks from me are in order, I wish to thank President Gillett not only for the excellent address to which we have listened, but also for the fact that he is both a good cow breeder and a cow manager—and there is no better place for genius in this world than to be able to understand a cow, for the inside of a cow is the darkest place on earth and I know of no product of God that contains more of His mysteries today than a mother.

Thinking the other day of the human mother and going back

to Hippocrates and Aristotle, I thought of the fact that the finest intellects of this earth, from the days of the Greek, to the present time, have been steadily devoted to an effort to understand the mystery of human motherhood. All over Europe do we find schools devoted to her study. All over the United States are medical colleges devoted to her study. Do they understand her yet? No. And why? Because great is the mystery of life, and only a little way into this mystery has human intellect penetrated. And the mystery of motherhood is as great with the bovine mother as with the human mother.

When men stop to consider what life means, or attempt to understand what it means, they are smitten with wonder that there is not a larger comprehension on that question among the men who deal with it.

We have a small audience here, but we can go back to the thought that the Christian Church saw a time when there were but twelve men advocating the doctrines they stood for, and Christ had nothing under the sun left to Him but a choice of sinners when He selected those twelve apostles. There is an almighty sight in this world in a choice of sinners. There are some saints that I would rather not associate with than some sinners and we are all "poor critters," as Widow Bedott says, and yet out of that humble beginning only 1900 years ago, we see this wonderful spread, this wonderful massing of effort and of enthusiasm.

Now, we have, as I said, a small audience here today, though in 1872 there were but seven men came together to form this Association, the seed of this great industry, and we must not measure the proposition of the dairy interest of Wisconsin by any of its conventions.

That was a splendid thought that President Gillett uttered when he said that the only man that strives to do better is the man that is doing well.

Sometimes I get a little discouraged. I was at the baptism of this little Association, there at the borning of the infant, and I have sometimes felt as though the average farmer of Wisconsin had no care nor no thought nor nothing by which I could lay hold of him, and yet I know better. I have only to look at the

great material progress of this industry to see that I am a very poor diagnoser of the situation. It is bigger than I am; it is bigger than the Association, and there are thousands of men thinking about it and they are saying but little. And yet I often think that utterance of Christ on the cross is exceedingly applicable to the situation, "Father, forgive them, for they know not what they do." They know not what they do. And yet somehow or other, a wonderful work is being done, and when President Gillett spoke of Wisconsin's duty and her comparative product with the whole United States, standing only second, I thought to myself, " and only about one-third of the state is under the hand of the husbandman." What may not Wisconsin do when the whole of the state in this area is under the hand of an intelligent dairy farmer? What may not yet be done with that vast territory of the state in the north that is yet to be brought under his hand? Not so long ago we knew very little about that vast wilderness. I rode on the Wisconsin Central many, many miles a few months after that road was opened. I went along studying the cuts to see what the soil was. Since that time it has been coming gradually into the hands of the man who tills the soil. It is as yet a great unsolved problem and the portion of the state that is doing this dairy work is but a small part of the state, and yet $57,000,000 were rolled up last year as the earnings of these men.

That is not all; the cow has contributed to the substance of every farmer's family. Isn't that so? She is a wonderful creature, and do you wonder that the old Hindu called her the "Foster mother of the race?" Do you wonder that the old Hindu established her as a "titular divinity"— and that isn't a very bad word to use, is it, I don't know that I ever really saw the significance of it before.

Now, this county of Green is a very interesting problem and a problem I want some of you gentlemen from abroad to study and think about. Here is a little colony of Swiss people working up in a quiet, simple way, some of the most interesting problems connected with the history of dairying in this United States, and it shows what plain, simple, steadfast industry can do, the most wonderful solvent anywhere.

They came here, comparatively speaking, only about forty years ago, and commenced this industry, and we are told today that over three million dollars are deposited in the banks of this county as the surplus of their earnings, and I will guarantee to you that those old Swiss people have not placed a tithe of what they have got in the banks. The old German people are a peculiar people about money, they seem to distrust banks. I know in Jefferson county that Mr. Grimm told me when he started his bank that he could have had $250,000 from out of the stocking legs of the old German farmers. When you consider this distrust of the banks and then the amount in the banks of Green county, you may safely reckon that that is not nearly all they have. They have taken care of the cow and worked out this problem in the matter of Swiss cheese.

They suffer by their isolation. A few years ago they were in a very bad state; they had never identified themselves with the Wisconsin Dairymen's Association; they stood aloof. I used to regret it very much. I used to talk to some of their representative men about it, but we never could get them to identify themselves with us. The time came a few years ago when they found themselves up against a very bad problem; their cheese was getting into disfavor and becoming somehow or other in a bad condition and they didn't know what to make of it, and they finally appealed to the Wisconsin Dairymen's Association and it sent one of its men down here and he went to inspecting and found that they were innocently and ignorantly pursuing a method of practice that was destroying the flavor and quality of their cheese, and that inspection aroused them and from that time since they have identified themselves with our dairy school and more with our Dairy Association. They have been doing better work and they have learned that no set of men on earth can live to themselves alone, and I believe that the future of Green county and the profitable carrying on of Swiss cheese making is but on the very threshold of what it is to be.

I do not want to inflict any further remarks upon you, but I want to say to you that for an old man who has watched this industry for a good many years, particularly in Wisconsin and who has seen the marvelous development of it, he feels a good

deal sometimes as though he could say with him of old, "Now let thy servant depart in peace, for mine eyes have beheld Thy glory."

Recess till 1:30.

The convention met at 1:30 P. M., March 11, 1908.

COWS *vs.* COWS.*

By WILBER J. FRASER, Chief in Dairy Husbandry, Illinois Experiment Station, Urbana.

Mr. President, Ladies and Gentlemen: After ten years' study of the subject from the economical standpoint, I do not hesitate to express it as my settled conviction that the weakest spot in the dairy business is the poor cow.

The actual relation of the efficiency of the individual cow to the real profits in dairy farming is a matter little realized by the people depending upon this occupation for a living. The profits on the average dairy farm today can be easily doubled.

THE COW IS THE MARKET.

A dairyman considers his market to be the place where he disposes of his milk, cream and butter, and in one sense this is true, but the place where he markets such of the products of his farm, as grain, hay and silage, is the dairy cow. The efficiency of the cow consuming these must therefore bear a vital relation to the dairyman's profits. If in a town having two grain elevators, one paid one-half cent a bushel more for grain than the other, no farmer would be foolish enough to sell his grain to the one paying the lower price. Yet dairymen will persist in keeping cows year after year that are paying them only twenty-five cents a bushel for grain, while others in the same herd, or that

* This title is used advisedly. There is a constant tug of war between the profitable and unprofitable cows in nearly every dairy herd.

can easily be obtained at a reasonable price, will pay fifty cents a bushel or even more for the grain they consume. The difference in price which individual cows are paying for their grain is not so apparent as the difference at the elevators, but it is none the less actual and affects the pocket-book just as surely in the end.

As an illustration of the great difference in individual cows, notice the records of some of the cows in the dairy herd at the University of Illinois.

PRODUCTION OF ROSE FOR 12 YEARS, AND QUEEN FOR 8 YEARS: CONTRAST IN EFFICIENCY OF COWS.

Rose.			Queen.		
Lactation period, Mo.	Lb., milk.	Lb., fat.	Lactation period, Mo.	Lb., milk.	Lb., fat.
*21 1	14,462	701	10½ 1	3,471	126
21 2½	14,536	762	9½ 1	4,078	156
12 1½	10,247	507	13 3	3,838	134
15 1½	12,680	637	11 1½	5,474	194
13 3½	6,018	291	14 1½	5,726	196
16½ 1	10,412	511	12½ 2½	6,526	200
23 4	11,059	556	13	6,803	219
9	7,688	350	3	1,201	38
Total 12 yr.	87,102	4,318	Total 8 yr.	37,117	1,263
Ave.	7,258	360	Ave.	4,639	158

*The larger figures show the length of time the cows gave milk and the smaller ones the time dry.

ROSE HAD 57 WEEKS OF ADVANCED REGISTRY RECORD.

Twelve pounds of butter fat for a single week is the production required for admission to the Holstein-Friesian Advanced Register. Twenty different weeks in her third lactation period, Rose made more than 12 pounds per week. Three times in this period she made 17 2-3 pounds of butter fat per week. For

five successive weeks, six months after calving, her average was 13 pounds of butter fat per week. In her fourth lactation period, there were 16 weeks during each of which Rose made more than 12 pounds of butter fat; and in her fifth lactation period, 21 weeks.

Rose's average production for 12 years including time dry, was 7,258 pounds milk and 360 pounds fat. Her largest year was 11,146 pounds milk and 581 pounds fat.

Butter for 12 years, 4,318.36 pounds, worth at present prices (25 cents per pound), $1,079.59.

Skimmilk for 12 years, 72,585 pounds, worth at 15 cents per 100 pounds, $108.88.

Total receipts for 12 years, $1,188.47, or $99.04 per year.

Just think what the receipts of a dairyman would be whose herd consisted of 25 cows of this kind—$2500 per year, exclusive of calves and manure.

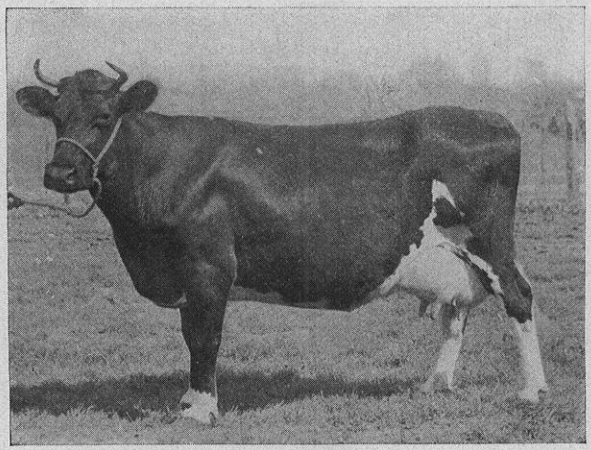
Rose was bought for $50 when 4 years old. She has had only ordinary treatment, no better than she would receive on a good dairy farm. She has not been pampered or fed to produce the utmost she was capable of making.

Remarkable as in the performance of this grade cow, she is not heralded as standing apart in unapproachable splendor, but as a great leader of the thousands of money-making cows in our dairy herds.

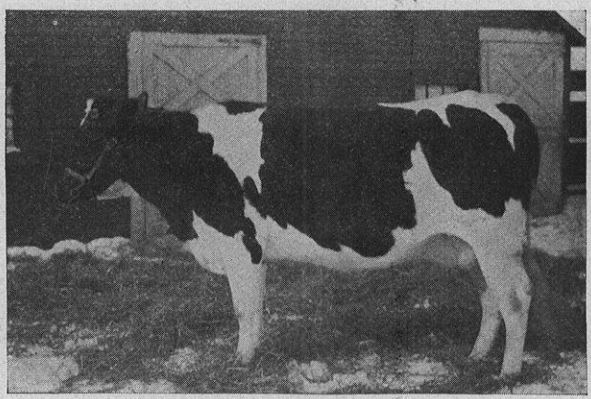
In striking contrast to Rose, and the class of cows she represents, is Queen. With equally good feed and care, Queen's average production for eight years was only 4,639 pounds of milk and 158 pounds of butter fat. Her production is but two-fifths that of Rose and she barely pays for her board.

BEST AND POOREST COWS IN SEVERAL HERDS.

Two cows, known as No. 1 and No. 3, were purchased from a large herd and taken to the University. They were fed and cared for in the same manner and their average production for three years was as follows: No. 1, 11,390 pounds milk and 404 pounds fat; No. 3, 3,830 pounds milk and 138 pounds fat.



ROSE AVERAGED FOR TWELVE YEARS 360 LB. FAT; MAKING $50 PROFIT.



QUEEN AVERAGED FOR EIGHT YEARS 158 LB. FAT LACKING 50 CENTS OF PAYING FOR HER BOARD.

Reduced to a like feed basis, the four cows produced for an entire year in the following ratios: Queen, 100; No. 3, 121; Rose, 304; No. 1, 312. The best two produced practically three times as much as the poorest two cows.

A little over a year ago, the Department of Dairy Husbandry purchased the best and poorest cows from six different herds. These were shipped to the University and a careful record kept of all feed consumed and milk and fat produced. The record for an exact year of ten of these cows from five of the herds is given below; showing the cost of milk and fat produced by the different cows at market price for feed.

BEST AND POOREST COWS IN FIVE HERDS.

No. Cow.	Lb., milk.	Lb., fat.	Cost per 100 lb., milk.	Cost per 1 lb., fat.
83	11,791	382.4	$ .61	$ .19
84	8,157	324	.87	.21
85	9,592	406.3	.75	.18
86	3,093	119.2	1.56	.40
93	9,473	353.6	.76	.20
94	7,846	282.1	.87	.21
95	14,841	469	.56	.18
96	7,686	324.1	.80	.22
97	8,563	291	.78	.23
98	1,411	52.8	2.77	.74

The records separated by the lines are of cows from the same herd.

Compare the amounts of milk, fat, and cost of same. This shows in a striking manner the difference in earning capacity of the different cows. The best cow of all produced over ten times as much milk as the poorest cow, and produced it at 56 cents per 100 pounds in marked contrast to the $2.77 required by the poorest cow to produce the same amount.

THIS DIFFERENCE GENERAL.

From the testing of over 1,000 cows in the dairy herds of Illinois, it has been proved that this great difference in cows extends to practically every herd in the state.

Included in the dairy investigations of this Station, are the individual records for a full year of 554 cows in thirty-six Illinois herds. To make a large and fair comparison, take the lowest one-fourth and the highest one-fourth of all these cows—278 head or half of the entire number. The lowest 139 cows (one-fourth of all) yielded an average of 133½ pounds of butter fat during the year, and the highest 139 cows produced an average of 301 pounds of butter fat.

The Elgin price of butter the past five years averages 23 cents per pound, and this is the usual price the dairyman gets for the butter fat in his milk, it costing the overrun to make the butter. At 23 cents per pound for butter fat, the poor cows make an average return of $30.77. At the low estimate of $30 per year for feed, this would leave 77 cents per cow for the whole year's profit. But the best 139 cows make an average income of $69.32. Allowing these better cows $38 per year for feed ($8 better than the poor producers) the clear profit is $31.32 per cow. These calculations allow the skimmilk, calf and manure, to pay for the labor and interest on the investment.

139 COWS MAKE $100; ANOTHER 139, $4,000.

The profit from the whole 139 poor cows is only $107, but the clear money from the best 139 cows amounts to more than $4,000. Every one of these good cows averages as much clear profit as forty-one cows of the poorer kind. Herds of these two kinds would have to be kept in the following comparative numbers to produce exactly the same profit for the owner.

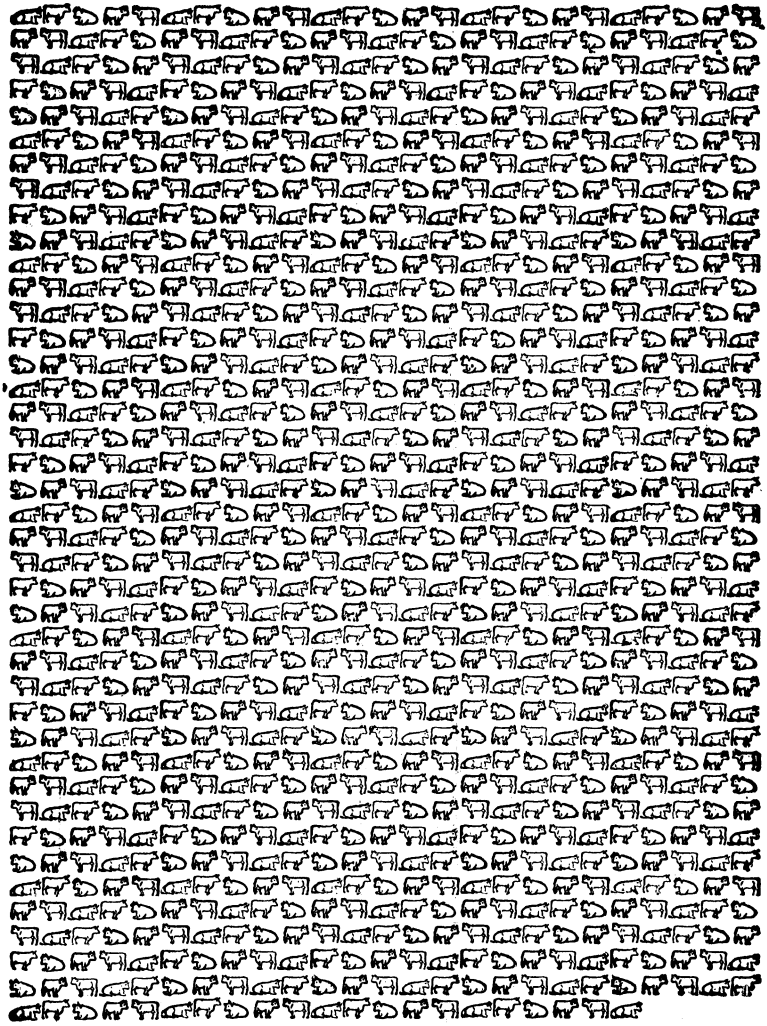
GOOD COWS		POOR COWS
1 cow	equals	40 2-3 cows
15 cows	equal	612 cows
25 cows	equal	1021 cows

Twenty-five cows, each producing 301 lb. butter fat per year, return a profit of $783.

This is the average production of 139 cows comprising the best fourth of 554 cows in 36 Illinois dairy herds.

The lowest fourth (139 cows) of the same 36 herds averaged 133½ lb. butter fat per year.

The picture below shows exactly how many cows of the poor kind, (1,021) it takes to return identically the same profit ($783) as the above 25 good cows.



THE PICTURE AND THE PROFIT.

These figures sound big, but in their abstract form they are too weak to tell the full story. The accompanying pictures show the exact relative sizes of two herds made up respectively of these two kinds of cows, that would yield the same profit for the owner. The one contains twenty-five cows and the other, 1,021 cows. They are all present to represent their value. In four and a half days each cow in the large herd earns one cent profit. The whole 1,021 make less profit per day than one carpenter. Thirty of them would produce the value of one acre of corn—if the ground isn't too rich and the price doesn't exceed 50 cents per bushel.

Twenty-five cows of the better kind would return the dairyman a clear profit of $783 per year. They could be kept on an 80-acre farm; they would require a barn only 32x45 feet and a 100-ton silo, and the cows themselves at $70 per head would cost only $1,750—a very good little business.

But a dairyman could make just as much money (and no more) from the 1,021 cows of the other kind. However, the investment would be somewhat different, and no dairyman in his right mind, would attempt to handle this herd, yet this is just what, in effect, many Illinois dairymen are now doing with at least a portion of their herd.

The only difference from the above picture is that the worthless quarter million cows of Illinois instead of being grouped in herds of 1,000 are scattered and mixed in many herds—some in almost every herd in the state. This enormous waste of the dairyman's investment, and time and effort has extended into almost every cow-lot in the dairy regions. Is it any more businesslike or any more profitable per cow, to keep five, ten or twenty-five such cows than to keep 1,021 of them?

HOW TO SOLVE THE LABOR PROBLEM.

We hear much in these days about the drudgery of the dairy business. And certainly it is drudgery to milk the number and kind of cows that many dairymen are attempting to do business

with, but what is the remedy? For answer look at the following table, which shows the year's production of each cow in a herd of thirty-four in northern Illinois.

LESS COWS MORE MONEY.

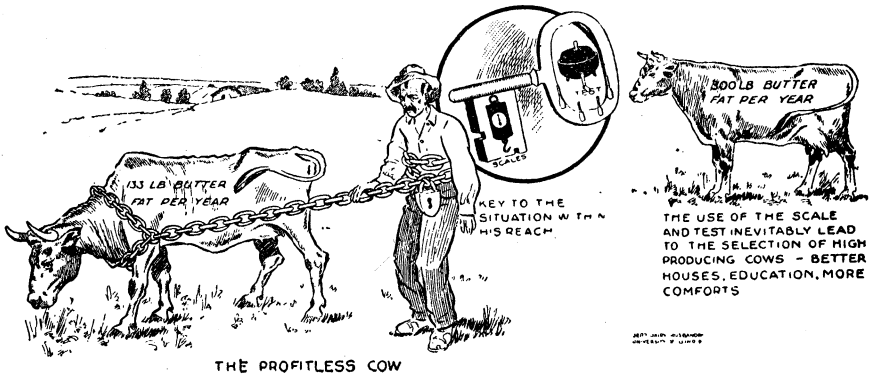
Cow No.	Lb., fat.	Value fat @ 23c per lb.	Profit per cow @ $35 for feed.
1	102	$23 46	$-11 54
2	107	24 61	-10 39
3	110	25 30	- 9 70
4	121	27 83	- 7 17
5	123	28 29	- 6 71
6	124	28 52	- 6 47
7	124	28 75	- 6 47
8	125	29 44	- 6 25
9	128	30 36	- 5 56
10	132		- 4 64
11	133	30 59	- 4 41
12	134	30 82	- 4 18
13	145	33 35	- 1 65
14	149	34 27	- 73
15	151	34 73	- 27
16	157	36 11	1 11
17	158	36 34	1 34
18	158	36 34	1 34
19	161	37 03	2 03
20	168	38 64	3 64
21	170	39 10	4 10
22	175	40 25	5 25
23	181	41 63	6 63
24	182	41 86	6 86
25	184	42 32	7 32
26	195	44 85	9 85
27	196	45 08	10 08
28	200	46 00	11 00
29	211	46 23	11 23
30	213	46 69	11 69
31	218	47 84	12 84
32	221	50 83	15 83
33	227	52 21	17 21
34	254	58 42	23 42

Profit from whole herd = $ 76 63.
Profit from last 19 cows = 162.77.

Here is a herd of cows that made for the owner $76.63 above market price for his feed and labor. If he had disposed of the poorest 15 cows (the first 15 in the table), each of which lost him money, he would have made $162.77. In other words, he might have been relieved of milking 15 cows and increased his actual profit by $86.14.

This same condition exists to a greater or less degree in practically all the herds tested. To remove the drudgery from dairying and give the dairyman the profit he should receive for his labor and money invested, these charity boarders must be found out, and sent to the butcher.

Tied to the Wrong Cow.



THE PROFITLESS COW

Americans don't take kindly to the idea of chains and slavery, but many a dairyman has unconsciously drifted into the condition of the man in the picture.

He doesn't know where he is going; he simply follows the cow. The dairyman has blindly followed without figuring; he has worked hard with his hands but little with his lead pencil, and the dollars have come his way very reluctantly. But the hands of science and the most successful dairy experience have provided him a key to the situation, and if he avails himself of its help there will be a reformation in that dairy. He will soon hand over his end of the chain to the butcher.

But do not mistake this cow for a rare specimen of an almost

extinct family. On the contrary, she is very common in all our dairies. The dairyman, who says that dairying doesn't pay, is "ten to one" boarding several cows of this kind in his herd. That chain is heavy and tight, but he has carried it so long that he thinks burdens belong with dairying, or he lays the blame to ill luck or a poor price for milk.

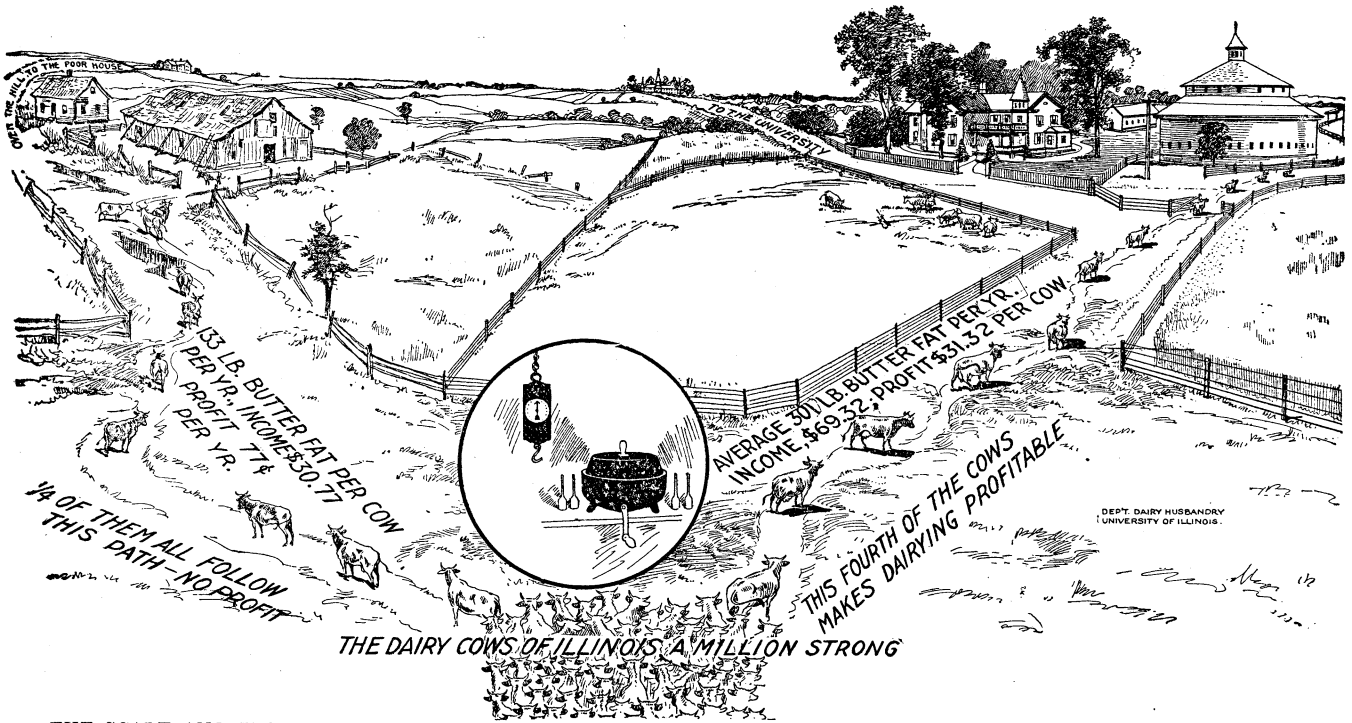
The faults and failings of the worthless cow have cancelled or concealed the profits of the good cow, just as human idlers are a tax upon their fellows. The good cow has to do the work for both. Not knowing the production of either, the dairyman has overestimated the poor and underestimated the good.

THE PARTING OF THE WAYS.

Illinois has a million dairy cows. Like men, they do not all travel the same path nor reach the same destination. Whither are they going, and how far, in their service for the dairyman? Who has stopped to ask, much less to answer, the question? What difference is there in their efficiency? In the profits they leave in the owner's pocket at the close of the year? The dairyman has been in the dark as to the paths his cows take. But under the arc light of the scales and the Babcock test the parting of the ways is made plain. Half of all the cows in Illinois take the one or the other of the above paths. Extensive investigations by the Illinois Experiment Station indicate that a fourth of all the cows in this state follow the left-hand path.

But the highest fourth of the 554 cows produce 301 pounds butter fat, and they are the cows taking the right-hand path above. These are certainly the right cows, and the path they take leads right on to the right things for the dairyman—profit, progress, plenty, an attractive home, wider usefulness, higher education for his children, and real enjoyment of country life for all the family. And the right dairyman will take great pains to add this kind of cows to his herd.

COW PATHS THAT LEAD FAR APART



THE SCALE AND TESTER STAND AT THE PARTING OF THE WAYS. THEY PROVE THAT EACH COW GOING UP THE RIGHT-HAND PATH IS WORTH AS MUCH TO THE DAIRYMAN AS 41 COWS ON THE LEFT-HAND PATH.

As seen above, the poor cows naturally find their way to a poor barn, a poor home, a poorly kept farm and a poor dairyman—and in the end, the dairyman will do well, after slaving hard for years, if he doesn't find his way "over the hills to the poor-house." If all these things are not met with on that cow path, it will be no fault of the great bovine procession traveling that way.

SAME DIFFERENCE EXTENDS TO HERDS.

Not only individual cows but large portions of herds, and even whole herds, take the wrong path at the parting of the ways. Of these 36 herds, all the cows of the poorest three herds averaged a profit of but $1.74 per cow per year. The average cow of the best herd is worth more than 24 cows of the kind that forms the poorest three herds. The writer shows three other dairy herds, the milk returns of which show a profit of 62 cents per cow for the year. While in the same neighborhood are three herds the milk of which average a profit of $60.94 per cow. One cow of this kind equals 96 cows of the other three herds. And in another locality the same kind of a contrast was found.

A little pondering of these divergent cow paths may help the dairyman to make a good turn for himself—turn on the light of the scales and test—turn off the poor cows to the butcher—and turn all his attention to the high-producing cows that make a specialty of turning feed into milk and money. It all depends on which path the cows take—and which cows the dairyman takes.

WEIGH AND TEST THE MILK INSTEAD OF GUESSING.

The profitless cow is a real and living issue and a large one in dairying for bread and butter. One of the greatest and easiest steps of improvement in the dairy business today is to discover and weed out these poor cows. Isn't it time to stop guessing at these vital elements in the profit of the dairy business and to find out for sure—by weighing and testing the milk—what each individual is earning for the owner?

We all know there is a difference in dairy herds as well as in individual cows. But do we clearly understand that some herds do not pay for the feed given them? That other herds pay too small a margin of profit to justify the investment in money and labor? And that still other herds are making their owners big money? When we realize this, it is easy to see how the profit can be doubled. Do dairymen in general know that these differences rest on plain causes and that may be readily understood, and that a change from the poor herd to the highly profitable herd is a comparatively easy matter, within the reach of any farmer who is able to keep cows at all?

Ten years of observation of Illinois dairy herds and the individual testing of more than 1,000 cows in fifty herds, has given the writer positive evidence of the practical worthlessness of about one-fourth the cows in these herds, and the exceedingly great efficiency and value of the best one-fourth. Both these classes of cows are common in every community, and as a rule there are some of each in every herd.

NO ACCOUNTS KEPT.

It is equally surprising that these poor cows are not known to the owner; their demand on his charity is not suspected. It is very hard to find a dairyman who employs any means whatever of knowing the exact returns from each cow in his herd. The ordinary dairyman has no idea of how much milk, butter fat or butter each animal produces in a year, or how much it costs to feed her. The natural result with the majority of our dairy farmers is large investment of money and labor for too small returns.

HAVE A PROFITABLE STANDARD.

Few, if any, herds tested by this Department but contained cows of the lowest fourth that produce only 133 pounds fat. Nearly every herd also has some good cows producing over 300 pounds fat. The dairyman should have a profitable standard and raise this each year, selling all cows that fall below

this standard. This is easily done and it requires much less energy to weed out the poor cows than it does to continue to milk them. Generally speaking, no dairyman can afford to keep a cow that will not average 220 pounds fat per year.

WHOLE HERD BROUGHT UP TO 307 POUNDS BUTTER FAT PER COW BY TESTING AND WEEDING OUT POOR COWS.

To illustrate how the production and profit of a dairy herd may be increased by testing the individual cows, disposing of the poor producers, and putting better methods into practice, I desire to call your attention to the record of the herd of Mr. Charles Foss, which was tested by this Station. The detailed record appears below:

No. of cow.	1904.			1905.			1906.		
	Milk, lb.	Fat, per cent.	Fat, lb.	Milk, lb.	Fat, per cent.	Fat, lb.	Milk, lb.	Fat, per cent.	Fat, lb.
1	5,970	4.55	272	.....	.....	.....	.....	.....	.....
2	8,579	3.19	274	8,062	3.2	262	10,201	3.55	363
3	4,818	4.27	206	.....	.....	.....	.....	.....	.....
4	3,212	4.7	151	6,663	3.9	258	6,895	3.88	269
5	6,260	3.72	237	6,196	3.5	218	.....	.....	.....
6	9,802	3.94	38	8,657	3.9	339	7,674	4.83	371
7	4,701	3.67	176	.....	.....	.....	.....	.....	.....
8	6,902	3.41	239	.....	.....	.....	.....	.....	.....
9	4,408	3.79	167	6,442	3.4	220	9,767	3 6	338
10	5,368	4.05	218	6,634	3.6	236	8,313	3.55	296
11	4,498	4.35	196	7,819	4.0	316	5,943	4 22	251
12	6,823	3.71	254	5,834	4 2	244	8,202	3.83	314
13	3,773	4.47	167	4,356	4.2	182	.....	.....	.....
14	5,890	3.26	1 2	7,731	3.1	238	8,211	3.24	264
15	.....	.....	.....	7,263	4.1	298	7,493	4.17	313
16	.....	.....	.....	9,630	3 28	317	12,999	3.30	439
17	.....	.....	.....	.....	.....	.....	7,589	3 83	303
18	.....	.....	.....	.....	.....	.....	6,669	4.15	277
19	.....	.....	.....	.....	.....	.....	8,697	3 31	295
20	.....	.....	.....	.....	.....	.....	4,342	4.8	*209
Total.....	81,194	.....	3,135	85,267	.....	3,128	112,804	.....	4,302
Av. per cow...	15,800	3.86	224	7,105	3.66	260	8,057	3.81	307

*For 11 months.

THE HERD THAT AVERAGED 8,057 POUNDS OF MILK AND 307 POUNDS OF BUTTER FAT PER COW.

GAIN OF 83 POUNDS BUTTER FAT PER COW IN TWO YEARS.

These figures furnish a very interesting study. It is seen that the 14 cows the first year averaged, 5,800 pounds of milk containing 224 pounds of butter fat; that the 12 cows the second year averaged 7,105 pounds of milk with 260 pounds of butter fat; and that the 14 cows the third year (1906) averaged 8,057 pounds of milk and 307 pounds of butter fat per cow.

FOUR HIGH GRADES THAT PRODUCED AN AVERAGE OF 10,060 POUNDS OF MILK AND 378 POUNDS OF BUTTER FAT PER COW LAST YEAR.

The greatest fact apparent at first sight is an average gain of 36 pounds of butter fat per cow the second year, and another gain of 47 pounds of butter fat per cow the third year—a total gain of 83 pounds per cow for the two years. This means a gain of 97 pounds of butter per cow in the year's production; which at the average price he has received amounts to about $24.25. This gain is much more than the whole profit from the average dairy cow in Illinois. The above increase is known from an accurate record of the weight and test of the milk for a week at a time every nine weeks throughout the year.

SACRIFICE OF DAIRY HEIFERS.

Many Illinois dairymen are not raising their heifer calves; instead the herd is replenished by buying cows. Four profes-

sional cow buyers sold about 7,000 cows in the vicinity of Elgin alone last year; besides this many cows were shipped in by dairymen themselves. On many dairy farms the heifer calves, good, bad and indifferent, go for veal. Where this is done it means there is no provision for perpetuating the dairy herd or the best cows in it.

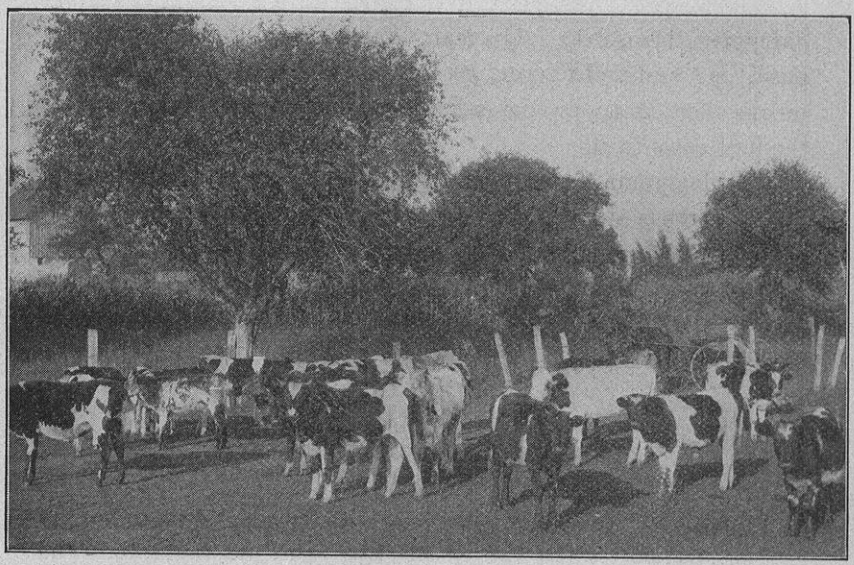
The dairyman from whom the Illinois Station bought cow No. 1 (whose story is told in this paper) with a three years' record of 405 pounds of butter fat per year, was making no effort to perpetuate her superior qualities but was selling her calves at $2.50 each. This is certainly a ruinous practice to the dairy business.

TENDENCY IS TOWARD POOR COWS.

The cow buyer cannot get enough really good cows to supply his purchasers, as but few of the best cows are for sale. The dairyman himself must raise the heifer calves of his best cows, and not depend on anybody's offerings to replenish his herd. He has the breeding stock, the feed—cheap feed—and the equipment. Calf-raising is a natural part of his business. It is absurd to suppose that as a rule he can buy as good cows as he can raise. The reasons are very plain. He needs to retain but few calves each year and can sell the less-promising ones. He knows the parentage of the calves and need save none but those from high-producing mothers. It is far easier to sell inferior stock (to the butcher) than to buy cows that are excellent producers.

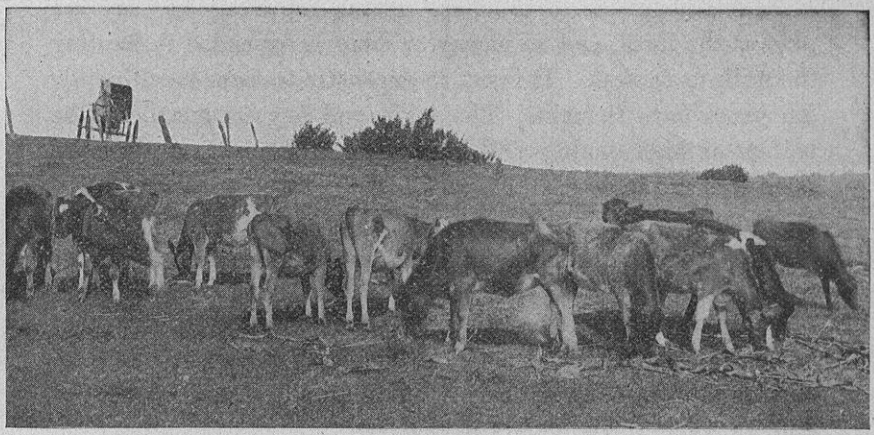
A prominent dairyman of the state says of his grade herd, "The heifers we raise from our best cows are better milk producers with their first calves than are the average mature cows we can buy." Several of our most progressive dairymen have said practically the same thing.

The three accompanying illustrations taken upon Northern Illinois dairy farms, well illustrate the right way to keep up the herd. One picture shows a boy's gathering of sacrificed calves that give promise of developing into a good herd for him.



A SHREWD YOUNG FINANCIER'S CLEVER DEAL IN PICKING UP THESE SACRIFICED HEIFERS AT FROM $2 TO $3 APIECE.

PERPETUATING THE GOOD QUALITIES OF THE TESTED MOTHERS, MAKING A HERD MUCH BETTER THAN YOU CAN BUY.



THESE TWELVE CALVES ARE HALF AND THREE-QUARTER BLOOD GUERNSEYS. THE OWNER REFUSED $50 APIECE FOR THEM WHEN 15 MONTHS OLD.

A MISTAKEN IDEA.

Yet in the face of all this, hundreds of dairymen make no effort to save their best heifer calves, and they think they have a reason. They say that it takes too much milk. This question was carefully investigated with forty-eight calves by the Illinois Experiment Station. Twelve calves at a time were tested at four different times. It was found they could be successively raised on 150 pounds of whole milk and 400 pounds of skim-milk. This milk was fed at the rate of ten pounds per day until the calves were fifty days old, when it was gradually lessened one pound per day for ten days and then no more was fed. No substitutes for milk were used. Only ordinary grains which the farmer produces, and a good quality of legume hay were fed, showing that the dairyman can raise a calf in this way with almost no extra trouble. Several of these calves are now cows in milk and good producers, indicating that they were not injured by this method of raising.

The sale value of the milk fed these calves was as follows:

150 lb. whole milk @ $1.00 per 100	$1.50
400 lb. skim milk @ $.30 per 100	1.20
Total	$2.70

And these prices of milk are liberal, especially as they are paid at the farm, and no money or labor is expended in hauling the milk to market. It is not so expensive to raise a calf as the dairymen have thought. The grain and hay consumed by the heifers of high quality will give much better returns than the same feed fed to cows.

CHEAPER AND BETTER THAN YOU CAN BUY.

A prominent and successful dairyman of the state says that he can raise a heifer to the age of two years at a cost of $20, including the value of the calf at birth, and he has been offered $50 for some of his heifers at that age.

Another dairyman who has successfully managed a large herd of cows for several years, estimates that it costs about $18 a year to raise the average calf.

But even allowing $40 to raise a heifer to the age when she begins to give milk, she will then be the equal of cows that could be bought for $60. Here is a clear advantage of $20 per cow in raising over buying, but the actual added profit in the life of the home raised and well-raised cow is more apt to be two or three times this amount. Isn't this a good business proposition?

Another great advantage in raising the heifers is that the owner may feed his calves in the correct manner to develop them to their greatest capacity. Cows that have been properly raised are much more efficient, and therefore worth more than if they had not been so raised.

Somebody somewhere must raise the dairy cows, and that somebody must be a dairyman if the calves are to be of high quality. Such calves cannot be raised on the range like feeder calves, horses and sheep, because they must be raised from tested dams.

If breeding means anything anywhere, it means that the quality of large milk production is likely to be transmitted to the daughters. This has been so thoroughly established by thousands of tests that it admits of no argument. There is no other animal from which such an absolute and complete record of performance can be secured as from the dairy cow. Shall the value

of these records to her progeny be thrown away by not saving the good heifer calves?

Nobody else has so many natural advantages as the dairyman for raising good heifers, and nobody else has the dairyman's interest in or is likely to succeed so well at it. That it is not now more generally done in Illinois is one of the vital defects in our dairying, and one largely responsible for the poor or very ordinary results too often obtained on our dairy farms.

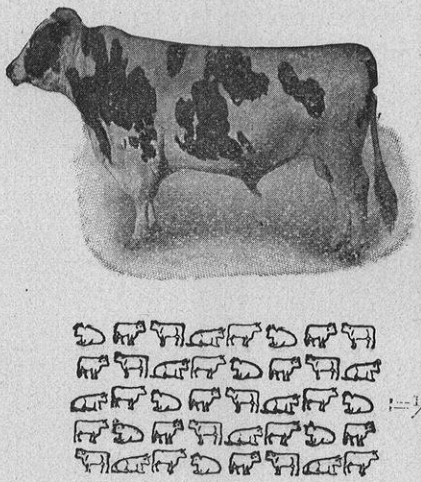
PECULIAR VALUE OF A GOOD DAIRY SIRE.

Raising the heifer calves of good high-producing cows, is a great fundamental requisite for the best and easiest improvement of the dairy herd. But those calves will take their qualities from both parents, and it is equally important that the calf shall have good parentage on the male side.

An inspection of dairy herds will show that many times comparatively little attention is paid to the quality of the sire. In a recent visit to the dairy region of Northern Illinois, the writer noted six herds in which the heifer calves were raised for future cows, but in which the sires used were miserable little scrubs, veritable runts and weaklings, obtained by simply saving a grade calf from a poor herd. Of many other sires fairly good as individuals, nothing is known of the actual milk production of their female ancestors.

THE SIRE EQUALS HALF OF THE HERD.

With a herd of 40 cows, as here illustrated, each cow represents 1-80 of the future herd each year, and the whole number of 40 cows represent 40-80 of the herd, and the good well-bred sire represents 1-2 or 40-80 of all the quality and qualities, character and characteristics, *the capacity for milk production*, and everything else, transmitted to the calves which are to constitute the succeeding herd.



A fine dairy sire can be bought for $150.00, and with 40 grade cows at $60.00 per head, the herd comes to $2,400.00. The bull costs only 1-17 of the investment, yet he will improve the future herd as much as the other 16-17. The extra $100.00 put into a good sire is the best investment in the herd.

Forty-one animals are purchased; one animal will influence the future herd as much as the other forty. It is worth while, then, to give much extra time and study to the selection of that one, the sire.

From generation to generation the succession of well-selected sires goes on increasing and intensifying the improvement of the herd. In this way the sire becomes three-fourths, seven-eighths, fifteen-sixteenths, etc., of the herd. In fact in a few years the sire is practically "the whole thing."

So the sire may be much more than half the herd whether judged by the quantity, strength, quality, or accumulated effect of the characteristics he transmits. It is literally true that the sire may thus, within a few years, at slight expense, completely transform a dairy herd and more than double its profit.

Every man who has had any extended experience or observation in the use of a good pure-bred sire from high-producing dams at the head of a dairy herd, will agree that this sire was of peculiar value and great economy in building up the herd.

The records of dairy breeding have proved it conclusively a thousand times over. No man who studies the facts can doubt it. The evidence is to be seen in the heifers of every such sire, and in their contrast with heifers lacking such parentage.

COST VS. VALUE OF A GOOD DAIRY SIRE.

As previously shown, improvement in the dairy herd must come largely from the sire side. A few poor females may do little permanent harm to the herd but a poor sire will do untold damage. The pure-bred sire is almost to be more prepotent than the grade cows. No more economical investment can be made by a dairyman than to spend time and money in obtaining the best sire possible. Frequently dairymen hold the penny so close to the eye it is impossible to see the dollar a little farther off, and this is just what a man is doing who has a dairy herd and thinks he is economizing by buying a poor or even common sire.

ARITHMETIC APPLIED TO THE QUESTION.

If, for example, the good pure-bred sire improves the milking capacity of his daughters by only one and one-half pounds of milk at a milking, above the production of their dams, this would mean an increase of 900 pounds of milk for the ten months or 300 days during which ordinary cows should give milk; they would also be much more persistent milkers; that is, would give milk for a longer time in the year, and would regain their flow of milk better after an unavoidable shortage of feed as in summer drought. Such daughters may certainly be credited on the average with 1,000 pounds more milk per year than their dams produced. At the low estimate of $1 per 100 pounds, this extra amount of milk would be worth $10 per year. The average cow is a good producer for at least six years, or until she is eight years old. Each daughter having a pure-bred sire will therefore earn $60 more money in her lifetime because of the good qualities of her sire. It will on the average be four years after purchasing the sire before his first daughters

will have finished their first lactation period and brought in the first extra $10. Eight dollars and twenty-three cents kept at compound interest for these four years at five per cent, will equal $10, so a daughter's improvement or increase of income the first year is worth $8.32 at the time her sire is purchased. The cash value of the daughter's improvement (inherited from the sire) figured in the same way for each of the six years she gives milk is shown in the following table:

RESULTS FROM A GOOD SIRE.

One daughter's improvement first year	$8.23
One daughter's improvement second year	7.83
One daughter's improvement third year	7.46
One daughter's improvement fourth year	7.11
One daughter's improvement fifth year	6.77
One daughter's improvement sixth year	6.45
One daughter's improvement for six years	$43.85

The total increased income for the lifetime of a common grade cow over her dam because of having a good sire is $60. The above table shows the cash value of this $60 as $43.85 at the time the sire was purchased.

In an ordinary dairy herd of 40 cows, an average of 18 heifers per year should be obtained, and 12 of these should be worth raising, making it easily possible for a bull to earn 12 times $43.85, or $526 per year. This would amount to $1,578 in the three years that a bull is ordinarily kept in service.

COST OF PROVIDING EVERY HEIFER ONE GOOD PARENT.

	Pure-bred.	Scrub.
Cost of sire	$150.00	$30.00
Interest, 3 yrs., 5 per cent	22.50	4.50
Cost of keeping, 3 yrs	100.00	100.00
Risk, 3 yrs	50.00	10.00
Total expense, 3 yrs	$322.50	$144.50
Value at end of 3 yrs	100.00	30.00
	$222.50	$114.50
	114.50	
Extra cost good sire, 3 yrs	$108.00	
Extra cost good sire, 1 yr	36.00	
Extra cost good sire, 1 daughter	3.00	

Considering the male calves as worth no more than if sired by a scrub, it would then cost $36 to provide one good pure-bred parent for the 12 heifer calves which are raised each year, or $3 per heifer. Where else can such an investment be found? Three dollars expended bring in an average return of over $7 per year for six years, or $43.85 in all. This makes a clear addition of $43.85 to the income of each daughter or a net profit of $40.85—and of $1,470 for 36 daughters in the three years. Here is nearly 1,000 per cent profit on the investment. The original cost of the good sire looks very small beside the $1,470. It really pays, as nothing else on the farm pays, to put $150 into the right kind of a dairy sire that will return practically ten times $150 within three years.

An examination of details will show these estimates to be conservative. There is plenty of margin left for failures and unfavorable conditions. One thousand pounds of milk per year is a conservative estimate of the improvement of the daughter's production to credit to a good sire, but the details of figuring it may be varied to suit conditions in different herds and different localities. One hundred fifty dollars is certainly a liberal allowance for the purchase of a pure-bred sire, and results here named are based upon having a first class animal at the head of a herd. A herd of only 35 or 40 cows is taken for illustration, while a vigorous sire properly fed and exercised is sufficient for a herd of 45 or 50 cows provided he is not allowed to run with them. There is another distinct improvement of the good sire's daughter besides her milk production; it is the improvement of her blood or breeding, as the result of which her daughters will be better milk producers. This blood improvement of all the daughters accumulated through a series of years means a remarkable increase in the efficiency of the herd.

COMMON EXPERIENCE.

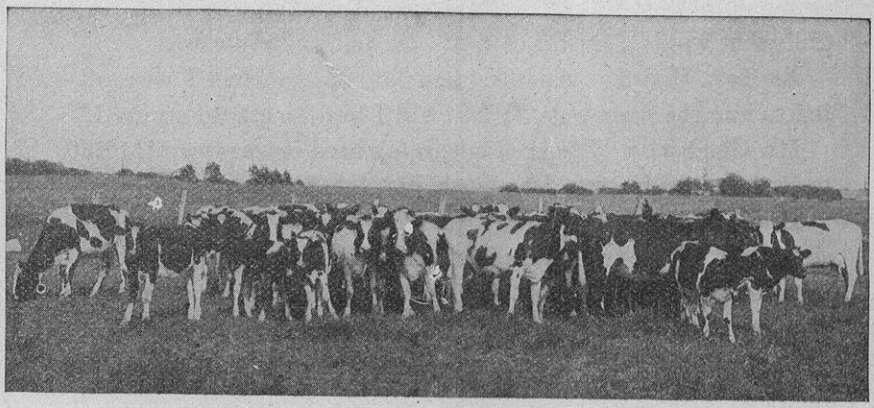
It is the common experience of all dairymen who have used a really good improved dairy sire that the investment has made them royal returns. The $150 cost price looks "too big" only to the narrow vision that cannot see the natural improve-

ment of the herd certain to follow. Many a dairyman might have reason to say that he cannot afford to pay a big price for a fine cow, but the same argument does not apply to the purchase of an improved bull, because the sire's influence spreads so much farther and faster than that of the cow.

If the heifer calves are to be raised for dairy cows, there is absolutely no business or reason on earth for keeping a scrub bull. The dairymen who think there is, pay a heavy price annually for maintaining that tradition. The scrub bull is the most expensive and extravagant piece of cattle flesh on any farm. He does not stop at being merely worthless but will lose the farmer the price of two or three good bulls every year he is kept. The dairyman could not afford to keep a scrub bull if the animal were given to him, if he were paid for boarding the beast and given a premium of $100 per year for using him. The presence of the scrub sire in so many Illinois herds—many times without a single qualification except that he is a male—is an offense and disgrace to the dairy business and a plain advertisement of the dairyman's thoughtless bid for failure.

FACTS FROM ACTUAL RECORDS.

In the herds tested by this Station in one portion of the state, the average annual production per cow where grading has been practiced is 263 pounds of butter fat, and in the herds where grading has not been practiced, the average annual production was only 178 pounds, making a difference in favor of grading of 85 pounds butter fat per cow, which is worth at 25 cents per pound, $21.25. This improvement by actual test in the dairy herds of the state, is over twice that attributed to the good sire in the estimates above. For further facts on the benefit of a pure-bred sire, look at the illustrations.



Starting with common red cows, the above herd is the outcome of 14 years' continuous use of pure-bred Holstein-Friesian sires. The result is that every animal in the herd looks like a pure-bred, and the herd tested by this Station last year averaged 6,850 pounds milk which is large considering that a goodly number were heifers.

The owner has paid only $212 for pure-bred sires during this time, and has sold $2,300 worth of fine cows to other dairymen. Fine as this record is, the owner would have done far better still had he paid more attention to getting sires with better individuality, and whose female ancestors for several generations had been large producers, and when possible, selected tried sires that had proved their worth by daughters that were large producers.

I close as I began. *The actual relation of the efficiency of the individual cow to the real profits derived from dairy farming is little realized by the people depending upon this occupation for a living. The profits on the average dairy farm today can easily be doubled.*

DISCUSSION.

Mr. Goodrich: Speaking of discarding unprofitable cows, I was one time urging a man to discard his poor cows so as to

make a profit on the rest and he says, "I wouldn't do that. If I did, what would I do for cows?" He had to have cows.

Ex-Gov. Hoard: Another man said to me when I was talking to him the same way, "What will I have to eat up my feed?"

Mr. Goodrich: I figured out in my herd it was worth $12.50 to feed and milk a cow for a year, just for the labor.

Prof. Fraser: It is taken for granted that the calf and the skim milk will pay for the labor and the interest on the investment and the depreciation on the cow. Any cow that is worth keeping at all ought to give at least 220 pounds of butter fat.

Secy. Burchard: In your figures you have only given the increase in the value of milk production. You have said nothing about the extra value of this heifer in producing other cows so that there shall be several series of gradings up. There is another thing you have left out, the extra value of this heifer, if you want to sell her. If a man wants to dispose of his cow, how much more would he get for the product of the pure bred sire over the product of the scrub sire?

Prof. Fraser: He would certainly get more.

A Member: You have shown us this picture of these calves that sold for $50 apiece. What would good stocker steers be worth at eighteen months?

Prof. Fraser: I don't know, I am not very well posted. Certainly not as much as $50, and you must keep a cow a year in order to raise them.

Secy. Burchard: At our convention at Waukesha two years ago Ex-Gov. Hoard had that question under consideration, the relative value of raising grade heifers for the market and for their sale value, as compared with raising steers for their sale value. With us these grade heifers are worth at eighteen months old $50 apiece. I guess every one will agree that beef steers not finished for the market but costing the same to raise, and in the same condition as the heifers, would not be worth as much.

A Member: They would be worth about $25.

Secy. Burchard: Now a question that is often put to us, especially by our dual purpose friends, is to this effect, half the calves of these cows will be steers, and we want to raise the steers to get money out of them. Why don't these people think

a little bit and raise the heifer calves and sell them for twice as much money at eighteen months old?

Prof. Fraser: These calves were not sold for that. The man was offered that and refused it. He said he had been buying cows and he didn't know where he could replace those heifers for that amount of money.

Ex-Gov. Hoard: In your travels around through the dairy districts, Elgin, for instance, you have spoken of, what is the number of men who are grading up their cows?

Prof. Fraser: The number is greater, Governor, of those who are not grading up their cows.

Ex-Gov. Hoard: What percentage of these farmers in Illinois who are keeping cows for profit, keep a pure bred sire, in your experience?

Prof. Fraser: I don't know, I wouldn't want to answer that without giving it some more thought than I have, it is exceedingly few; I would say not over one-fifth.

Ex-Gov. Hoard: And that is in the old dairy districts, among farmers who are supposed to possess at least a thimbleful of brains.

Prof. Fraser: Yes, at least that much.

Ex-Gov. Hoard: Oh, they are a hard lot.

The Chairman: Isn't it a fact that dairymen around in the Elgin district are not breeding to any great extent?

Prof. Fraser: It has been true around Elgin, but out in the Marengo district it has not been true so much. Around Marengo they are raising calves every year on pretty nearly very farm. I know of only one case where the man has used a pure bred sire on common red cows for fourteen years. He has a herd that you can hardly distinguish from pure breds in color. He has paid in that fourteen years $212 for his sires and he hasn't done as well as he could. He has not paid any attention to the selection of the dam of the bull. He has sold $2300 worth of cows to his brother dairymen and has a herd of 57 head left and they are pretty good looking cattle. I have a picture here of a place where a man who started in twenty years before this picture was taken and he said that at that time he would have been glad to have stepped out of the farm, which he owned, with his clothes on his

back and his debts all paid. He went to town determined to get rid of it and he talked to the lawyer and he advised him against that course and in twenty years from that time that man was worth $66,000 and there was not much of that due to the increase of the value of his real estate either.

Ex-Gov. Hoard: I want to give a little bit of personal experience in regard to the value of the sire.

I have in my herd to-day a sire six years old. I have any number of old German farmer neighbors, good men, too, who come into my barn and talk to me about how they can't afford to buy a good bull. Now, Fritz and Chris and Hans and Carl all pretty nearly agree, and they say to me, "You throw your money away." But I bought this calf and I paid a long price for it. One old German said, "You tink I put all that money in one calf's hide? Not much, no, it vas humbug. I know not a man all my life who is so easy for humbug as a Yankee." I said, "You wait, I will show you whether it is humbug or not." I bought him because I knew he had splendid blood in him and he was a good individual. Now, up to to-day, I have sold and am keeping at a moderate valuation over $6,000 worth of stock from that bull. Now, cut it right in two and give the mothers credit for half, and he stands with $3,000 to his credit for the price I paid for him. But then Chris says, "Oh, well, you may do that, but I couldn't do it. You got some reputations. I got none, I be only farmer back here in the country." Old John Zeigler actually said that to me, but I answered, "I didn't get it, John, by saying 'I couldn't do it.'" "No, that is so." Now, as I said, give the cows one-half credit and there will stand $3,000 to the credit of that bull and I am offering him for sale today, as I think I must dispose of him, and I will get a good fair price for him; I will get pretty nearly half what I paid; there are plenty of men who stand ready to take him. Now, Prof. Fraser has just touched on the shore of this question.

Another little thought. I sold to a man by the name of Miner ten little Guernsey grade heifers and ten thoroughbred heifers; the twenty were raised together in one bunch and fed just alike and I got $250 for the grades and $1,500 for the pure breds and they were all seven months old. I could sell a thousand

such grade calves today for $25 apiece if I could find them, at six and seven months old. I will guarantee to find a market for a hundred times the number and they can't be had, and why? Because the man back on the farm don't see it. He don't see the value of good blood, he don't see the market. A farmer came into my office one day and he was lamenting that for the Guernsey bull that he paid $80 for as a calf he could get today for him only $40, down at the stock yards. I said, "Heaven bless your soul, what are you taking a pure bred animal down to the stock yards for? You wouldn't think of taking goose feathers to a pig iron market, would you?" "There's no goose feathers about this business," he says. "Well," I says, "what are you taking him there for?" "Well, that is all the farmers around are giving." "But they are not the market." "Where the devil is the market?" "Why," I says, "it is in the men who want this stock and they are scattered all over the country. Stick a little advertisement in the Dairyman, just say that you have this bull, his age, and give reference as to who you are." Now, there is a little bit of commercial wisdom and a little wit in this thing. I said, "Say in your ad that the first man that sends you $70 for that bull can have him." Tom stopped and he says, "What will it cost?" "It will cost you $5.00." "Danged if I'll pay it." "No, I know you won't, Tom, you belong to that class of men that wouldn't give 50 cents for a dollar bill; I know plenty of them." "You try me, and see whether I would or not." But there he stood, you know, holding $5.00 so close to his eyes he couldn't see the $70 behind it. Well, I coaxed him; it was like teaching a baby to walk, but I finally got him to do it. In about a week he came in and he says, "Well, my gorry, where does your danged old paper go to?" "What now, Tom?" "Well, I can't be answering all the letters that come to me. There's as much as a hundred men writing to me. I didn't suppose there was that many men in the world that wanted a Guernsey bull." "Why don't you think a little bit? Can't you go down to the post office and buy a hundred post cards and pay a dollar for them and sit down and answer these people? You don't know where your customer is. Answer them, answer them, have some common sense." Away he goes and in about a week he comes in.

"Well, well, well, for the love of the Lord, what will I do now? A man out west says for me to take my bull down to Whitewater, and here is your money! I wouldn't think any man would be sending me money like that." "Well, now, that's all right, Tom, do you see." The next week he came in, and in a worse flutter than ever. "What is the matter now? "Well, for the love of God," he says, "do you mind. Here are four drafts, $280, and I haven't a horn or a hoof for it. I have got to send that money back, and it just breaks my heart." "Yes, Tom, no living man on earth can afford to be dishonest. You send the money back, but now will you learn your lesson, which is this, that there are men all over the country looking for that kind of good stock wherever they can find it, and if they had any kind of chance to exercise the common confidence there is in human nature they would be glad." Why, don't you know, my good neighbors and friends, the greatest luxury in the world is to be able to trust men, the greatest luxury on earth is to be able to trust your fellows. I am glad Professor Fraser has brought out this idea to us at this time, and I only wish we had more of Green county here and its farmers. We have Germans over in Jefferson county too. This thing has been pounded and pounded and threshed and talked into those men and more thoroughbred bulls are kept in Jefferson county today in proportion to the number of farmers, I believe, than any county in the west and the money pours in for stock until those men hardly realize what they are making; and yet we have men right there with those things going on right before their eyes who had rather keep a scrub bull today than to keep a thoroughbred sire, and you cannot teach them. The country has no hope of these men except a funeral. Many times boys have come to me with tears in their eyes and have said, 'Father won't let us do a thing. Father won't let us go to the Short Course. Father won't let us have a book. Father won't let us read.'" I tell you what, it stirs my old heart when I hear those boys talk.

The Chairman: They will be the fathers of the next generation.

Ex-Gov. Hoard: That is the only hope the country has.

Thank God, that is true. Those men are so completely settled down in the muck and mire that they can't see over the rut.

But, I tell you, good people of Green county and all of Wisconsin, we can take heart; all the indications show that. Up in Barron county they have three associations among the farmers, they have a Holstein Association, a Jersey Association and a Guernsey Association. Why, those farmers up in Barron county are a thousand times as enterprising, alive and keen today to what they are about, as the farmers in the southern part of the state; they have not got rutted down, and you will see the whole country going up into Barron county in a few years after good cattle.

JUDGING THE DAIRY COW.

Ex-Gov. W. D. Hoard, Fort Atkinson.

Mr. President and Ladies and Gentlemen: What I say to you today will be in an extempore manner.

It is a number of years since I began lecturing on this topic, but it is only yesterday or more properly today since I quit thinking about it. I have given this talk in one form or another in almost every state in this Union and in all the provinces of Canada, from Manitoba to Nova Scotia; in one case for instance, talking on dairy temperament in cattle, in another talking upon the dairy outlines of cattle and so on.

Now, I want to start in by saying that there are two great ruling temperaments in cattle; one is a flesh-making temperament, and the other is the milk-making temperament; that all cattle, even those of the flesh-making temperament, have the power to give milk to a certain extent. They must do this for the sustenance of their young and after these two temperaments travel along the road up to a certain point, they begin to diverge.

Now, you start at the pinnacle of a pyramid and the widening of the two lines is very slight at the starting point, but when you get to the base of the pyramid they are far apart. So,

with cattle of the flesh-forming temperament, their inheritance is along the line of making flesh. If cattle have the dairy temperament, the milk-making temperament, their inheritance is along the line of making milk.

The point with the dairy farmer is this: Can I afford to spend my time, use my labor, preparing feed and taking care of cows, taking their product to the factory and all the expense that comes to the farmer, can I afford to do that with anything but a decidedly milk-making cow?

You heard today what Prof. Fraser told you how down in Illinois there are a great lot of farmers who are keeping cows and keeping them at scarcely any profit. If you could go back and look into the mind of the farmer that owns those cows, you would see they are hazy, they are in an indistinct state of mind. You would find that man, just as likely as not, saying to himself, "the kind of cow I want is a cow that will make steers," while all the time he is subjecting himself to a dairyman's expense.

What is that expense? It is the feed of the cow, the stabling of the cow, the care of the cow, the milking of the cow, taking her milk to the factory, and all of that amounts to a large sum. Now, then, I believe, and I think my belief has been borne out, that we need to divide right here and that men who keep cows need to have a clear, sharp judgment as to the character of the cow. Now, comes the question: I can't go out and buy cows and test them all, but I must have a sharp judgment and I must have some knowledge in me, some way of judging a cow.

I have been trying to tutor myself to that end for over fifty years. I started with a father who was a good judge of a cow. I had to leave the little district school when I was sixteen years old and go to work on a farm by the month, and it was fortunate for me that I was taken by a man by the name of Simonds, who owned fifty cows, and was the best dairyman I ever saw in those days. He said to me, "Come and work for me and I will teach you to make butter and cheese, and I will try to show you what there is to be known about the cow." And he knew more about a cow than any man I had ever seen. I worked for him until

I was twenty-one years of age, when I left and came to Wisconsin, fifty years ago.

Now, way back there that man Simonds had clearly in his mind the dairy development in cows, and he tutored me and the last two years that I worked for him I carried on his farm, handled his herd, made his butter and cheese. So you see when I approach you I do not come to you and have not come to any set of men, a mere newspaper talker. I have tried to study this thing out, and on my farm to-day I am working out this problem, just as every man can work it out.

What is this question of temperament in cattle? It is hard to define. About 1886, when I tried to put this thing into shape I could get no word that would satisfy me, and I used that word "temperament." As I studied the biology and the physiology of cows, I found that one cow had a specific heredity for one thing and another cow another. Where does it come from? I don't know. Nobody knows, but all through history, heredity has been a powerful thing.

Now, then, we have been preaching the wisdom of selecting thoroughbred stock for breeding purposes, and why? Because it has been kept true to one purpose for hundreds of years. Go to-day to the Island of Guernsey and Jersey, and you will find that they have not allowed other cattle to come upon those islands for a hundred years, and so they have kept that breed pure. Go into Holland and you will find that those old Hollanders have been careful to keep their blood pure.

What does this temperament, which is the bottom thing in the cow, way down in the foundation, what does it do? It creates function. What is function? The power to do in a certain direction. For instance, the beef cow has the function of making flesh. She gives it to her calf; she is bred to a sire that has the same function and so the beef-making function and the beef-making temperament is established, goes on and on down.

Another cow has the function of making milk. Temperament has decided that.

Now then, what will function do? It creates form. To make

that thing clear to you, let me stand up two machines here, a sewing machine and a mowing machine.

A writer in the Breeder's Gazette the other day, Mr. Miller of Ohio, ridiculed the idea of the dairy form. I thought to myself when I read his article, how little that man knew what he was talking about.

We have a mowing machine and a sewing machine. What is the function of the sewing machine? Sewing cloth. What is the function of the mowing machine? To mow grass. Are they the same form? Could you take your sewing machine out in the field and mow grass with it, or could you take your mowing machine into the house and sew cloth with it? No. Function decides form in every piece of machinery on earth; therefore whatever the thing is made to do it has a corresponding shape in the majority of instances; every machine has a form and a shape in accordance with the function that it is called on to perform, and so you see function creates form.

Now then, you come to the last step in the matter, you and I stand here in the field, or in the barnyard, and look at this cow and try to decide from her form what her character and function are. I will try to show you to-day some of the things that distinguish a dairy cow in her form and according to her function.

On this chart is the Holstein cow Tritomia; defective somewhat in outline. This slope of the rump is caused by the extra height of the backbone at the pelvic arch, giving a slope to the tail head, but she was a great cow. I first saw her at the Minnesota State Fair when I was a judge of Holsteins. They got into a fight among themselves, the Holstein breeders, and they asked me to come and judge their cattle, and they had 347 Holsteins, and I did the judging, and they had forty-eight aged cows in this class. This cow and a number of other Holstein cows, and Jerseys, all of them, were going through a three-days' test. When I came to look this cow over, I was struck with her at once, and the more I studied her, the more I was impressed with her power, and finally I gave her the blue ribbon. At once a great howl rose up from those Holstein men; they said I did not know the first principles of a Holstein cow. There was a cow owned by the same man, Mr. Ames, named "Mink," and

she was a beautiful cow, and those men said, "Why, that cow is worth a dozen of the other," and they stormed at me tremendously. I held my temper, kept still until I got them quiet, and then I said, "Gentlemen, I am going to do a dangerous thing. This cow, along with a lot of other cows, is in the test, and it is within a day and a half of being declared and I will risk every bit of reputation I have got on earth that this cow will justify my judgment when she comes out of the test. Now, shut your mouths and wait and see what this cow will do, and if she does not justify me, I will never open my head again on the cow question." So they said they would wait. When this cow came out of that test, she had beaten the whole of them, Jerseys and Holsteins and everything else, the whole bunch. Then these Holstein breeders came around me, and asked me to tell what I saw in the cow.

Now, there was the trouble; all the Holstein men looking at cows from the Holstein standpoint, and not from the cow standpoint. All the Jersey men looked at their cows from the Jersey standpoint and not from the cow standpoint, and there is the difficulty in this whole cow question; men are not looking at these cows from the mother standpoint.

Let us study this cow for a few minutes. You see over the whole cow a strong feminine look, don't you? You don't see anything of a steer character in this cow, nothing masculine, she is feminine; you see it in a minute, and that is at the bottom of things. Nature constructed her for her work as a mother.

Let us look first at the head, and let me tell you, gentlemen, that here is a tremendous great battery at work here, carrying clear through the whole machinery of this cow down to this udder, the nerve supply, the force that will enable her to do her work. Here is a cow long from the poll to the eye; a great full eye, sticking right out of her head. What does that indicate? It indicates abundance of nerve supply. What has nerve supply to do with it? The brain must support the spinal marrow, the channel through which all the nerve energy must flow through the body. The cow must have a large brain; the dairy cow needs more brain, a great deal, than the beef cow, because she has to supply an enormous amount of nerve force to this great organ

here, the udder. What is it and how is it conducted through her?

Now, see, a man judging this cow, looking at this question of the brain and the back always, he should study closely the structure of the cow's back for these processes set like my knuckles, and each one of these knuckles indicates somewhat the character of the backbone, and in studying the character of the backbone in the dairy cow, we see that it needs to be rugged, strong, large and full, and it indicates, somewhat, as much as you can indicate from the external, the power of the spinal marrow in this particular. The cow needs to give you evidence right here of a large, active brain.

Another thing, the cow should have a great nostril, a wide nostril. Why? Because the cow vitalizes the blood from the air; she must have great breathing apparatus, she must take in lots of air, and nine farmers out of ten to-day, being sinners before God and the cow, don't know that this question of air is of wonderful importance to the cow; she must have lots of pure air, because she must secrete the milk from her blood and she must vitalize her blood from the air she breathes, and if she can't have plenty of oxygen, if she is shut up in a badly ventilated, filthy stable, she cannot give that blood the vitalizing power that is necessary.

An old German said when I built my barn and put in the King system of ventilation, "How much did that cost you, Hoard?" "It cost me $350 extra." "Oh, mine Gott in Himmel, you can't afford $350 for air; you have it all around you." "But I haven't it here. I must keep the cows warm and if I shut up the cows tight to keep them warm, you know yourself that the air must be pure or else something is wrong." I went on to show him, I asked him, "What does the cow live on?" "She live on what she eat and what she drink." "And one thing more, what she breathes. If you take away her breath, she will die quicker than if you take away her feed or her drink, won't she?" "Yes," he says. "Well, the cow must have pure air, pure feed and pure water."

I wish I could show you how this circulation of blood goes to the udder. You would see a great big artery run-

ning inside from the heart and branching down from other arteries and veins on down to this udder. The milk is secreted from the blood and it takes an enormous amount of blood, and if you want to know something about it, look at these great veins here upon the belly. We call them milk veins, but they are not; they are the veins that take the blood back to the heart. Do you know of any such veins on a steer? No. Do you know of any such great big veins on a beef cow? No. Then why has Nature made those great veins? Because she sends an enormous amount of blood here to the udder and it must be sent back to the heart, and then to the lungs. How does it look when it comes from the udder to the heart? Dark in its color, it has taken up all the vile things in the body. How look when it comes out of the lungs and goes on again to the udder? Bright red. Now, what has happened? Oxygen has been imparted to it, it has been vitalized, been strengthened by the lungs. The lungs throw out this vile product that we call carbon dioxide and throw out other humors. Now, what becomes of them? What do they do? They vitiate the air. And what do we do? We shut the cow up, tight in the barn and refuse to give her any pure air, and then we stick our thumbs in our vests and say, "Behold, oh Lord, what smart men Thou hast made."

Go through the dairy districts of Wisconsin today and see how the farmers are shutting up their barns and not giving their cows pure air, and tuberculosis is going over the country and we are killing our cows and doing nothing to prevent it and calling ourselves intelligent men.

So I come back to the proposition that the cow must have a great big, wide nostril, because she must use up lots of air.

Look at the race horse. The old adage is that a race horse must have a nostril that you can put your fist into. And why? Because nature calls on that race horse to use an enormous amount of air and if the horse has to use a great deal of air, Nature provides him with a big nostril, and it is so with a good cow. If she has a small nostril, she is shut down in supply and just in that proportion is the cow injured.

She must have a strong, wide muzzle. That indicates that she

has large digestive organs. She must have a good, clean head, with a strong jaw. I do sometimes see good cows with a heavy neck, but a man is going to get left in this world if he takes exceptions for his rule; you must take what in the majority of cases is true, as your rule, and in the majority of cases a good cow shows a feminine neck.

The cow needs to be lean in the make-up of the shoulder and the brisket, a dairy cow should not be wide between the legs. I hear men talking about cows showing large lung and heart room by being wide between the legs, that is not true. I have followed hundreds of dairy cows to the butcher's block and weighed the heart and the lungs, and I did not know till I tried it, but it is true that a good dairy cow's heart and lungs will weigh more than the biggest beef cow's you ever saw, and why? Because Nature makes her use blood and lungs both more than the beef cow does.

Now then, a dairy cow needs a lean shoulder; I like to see cows with a pretty middling sharp shoulder, but I have seen fine cows that had not a sharp shoulder. So in all these things, the great broad proposition must be taken.

Then I want to see a cow with the ribs wide and spaced wide between. All these things indicate that a cow is of the milk temperament and not the beef temperament. If we had a picture of a beef cow here, I could show you that the beef cow's ribs spring out like this (indicating) so that Nature can lay a large loin, a fine lot of meat right next to the backbone, a big, heavy, fleshy loin.

Now, how is it with the dairy cow? Her ribs spring more like that (indicating) and the ribs are wider, the cow is built more open and relaxed.

Now, you come back here toward this great business end of the cow. When you come back here to the pelvic arch, right there, gentlemen, are the great processes of motherhood. Here lies the womb, where life is generated, and here the udder and tying this womb and this udder together is a great network of nerves called the sympathetic plexus, a wonderful set of nerves, and these two organs are connected indissolubly together. Disturb one and you disturb the other. They go to the spinal mar-

row, and connect with this great battery of the brain, and here comes the nerve supply down into the womb and into the udder. It is a wonderful piece of machinery.

I want the udder well constructed, I want this cow with wide hips; I want to see her with this in-curved thigh, cut out in here. Why, if she was a beef mother, she would be of thick blocky shape. I want to see the cow thin in her ham inside so there is a lot of room for this great milk-making udder.

Then I want this backbone rising high and strong and so continued clear to the tail head.

Another thing I prefer is a well formed tail, for the tail is a continuation of the backbone and is strong just as the backbone is strong, and consists of a series of joints in the same way and so the bony portion of the tail is an important feature.

We are going to have at the College of Agriculture at Madison some day a great department for the study of the domestic animals on the line of structure, as relating to function, and we are about commencing to see if we cannot establish it. I believe that, when you dissect this cow—and I would like to have obtained her skeleton,—I believe that you would have found that the spinal marrow that went through those processes of the backbone was unusually large in that cow, and I believe you will find that in every great cow in the world, that the hole through which passes the spinal marrow is large, indicating a great spinal marrow, a great channel.

When you come to the constitution of the cow, a lot of men tell me to see what her heart room is, her lung room. That does not indicate it; if it did, the great big width between the legs of the beefy cow would mean more than the little Jersey cow shows. I wish you would go to the block and find out what these cows show. If you take a big, beef cow, weighing 1,600 pounds, you will think, of course, you have got larger lungs and larger heart than you will find in a little dairy cow weighing nine hundred pounds, but the dairy cow has the largest lungs and the largest heart, for she has to use her blood and her breath a great deal more than the big beef cow.

Where should you look for constitution in the structure? In the abdomen. Constitution is the power to endure under the

function that the animal has. Take the race horse; his function is to run a mile or two miles on the race course. Is that race horse wide between the legs, is he wide-chested? No, and yet he uses more lung power and more heart power in running a mile than a draft horse would use in a week. Therefore some of these things that have been said to us are misleading.

What is the function of the greyhound? Speed. What is the function of the bulldog? Is it speed? No, and he isn't built that way, is he? No. Whatever the function is, you have a certain build. Now then, that won't tell you all the story, and no man can by the words of his mouth tell it to you; you have to have a judgment that words do not indicate.

There is a way of judging constitution, and I will tell you how I first learned it. I was a soldier, and I was ordered to go with an English surgeon to examine men for the draft. He found out that I had read medicine for a couple of years and he had me detailed to go along with him. I found out that he had a peculiar judgment of men in examining them. The men were stripped. I remember one splendid, six-foot chap, fine shouldered, loin, and limbs, and he rejected him. I asked him why, and he said, "No constituiton." "Why he looks to me as though he had the best constitution in the world." "Yes, you judge him by his build. You think strength of build is constitution. It is not. Constitution is something else. You and I have seen horses that could kill other horses. Very likely, if you look at them you can't see what it is." But the doctor said to me, "You will notice that among soldiers, some of very slight build will tire the big, strong men in the march. Now, I will show you where the secret is." And he brought me around and said, "Look at that abdomen." The moment I looked at the man's abdomen I saw something was wrong, though I couldn't tell what. He asked the man, "Don't you tire very quickly?" and the man said, "Yes, I can't work much. Some of my neighbors call me lazy." That was because he was a husky, strong looking fellow, but he had to be exceedingly careful, the doctor told him, because he had no vitality. The doctor explained the thing this way: "Constitution means vitality, ability to resist disease, to stand up and do your work, and that is some-

thing that is given by the mother and the mother supports the fœtus through the umbilical cord. Any physician that has ever taken note will have seen that when a babe is born with an umbilical cord that is thin and weak and spindling it is almost impossible to raise that child. On the contrary, if the umbilical cord is strong and thick, there has been a full strong channel between the mother and the fœtus, the child comes into the world husky and strong, ready for all the world has to give it.

So he said the structure of the abdomen was an indication of what the umbilical cord was, and when you examine a cow or a horse or anything else, if you are looking for constitution, put your hand down under like that, and with the end of your finger press up against the abdomen all around the navel and clear out from the navel and note whether the abdominal walls are strong, thick, heavy, and it is almost impossible to make any indentation into them. If you find that that is done easily, the walls are thin, look out for that man or that animal.

I used to be a breeder of foxhounds. A man brought me a pair of foxhounds, brother and sister, and asked me what I thought of them. I said, "I think the dog has a very keen nose but I don't think he will run an hour on the track, but I think the bitch will run all day and you can't pull her off at night." He laughed, and asked me how I judged, and I said, "By their abdomens. This dog's abdomen is thin, weak, like paper, while the bitch has an abdomen that is heavy, full; strong, muscular walls."

Now, this is my guide in judging constitution. I look at the structure of the abdomen and then I know that that is not an indication of capacity, but an indication of endurance. The cow that is giving forty pounds of milk a day is drawing on her constitution more than a horse that is plowing all day, and yet many men forget that the work of motherhood is severely exhaustive and that they ought to know something about motherhood, and if they do not they are unfit to have wives or cows. I do not class the two together, except in the one great generic proposition that both are mothers and both are drawn upon severely for the functions of motherhood, and I say that men in judging cows ought to study them from the standpoint of tem-

perament and then function, and finally form, and when you undertake to find what temperament and function are, go back from form to function and from function to temperament.

There are some things I cannot tell you that I know; I cannot put them into words. Let me illustrate to you. My hand, as I feel of a cow, conveys to me a wonderful sight. Let me tell you how I proved it in one case: Professor Haecker, of the Minnesota Experiment Station, had been carrying on an experiment with fourteen cows for a year, with a wide ration and a narrow one, one ration 5 to 1, another up as high as 8 or 9 to 1. He wanted to see whether the wide or narrow ration was the best thing, and so he worked on these cows for a year. He then asked our Professor Henry to come up and look them over and also asked me to come up. He asked me to tell from my judgment which of those cows had the wide ration and which had the narrow. I said to him, "Why, Professor, I can't judge this; I have nothing to go by, I don't know how I can do it." He says, "There ought to be some difference in their appearance and in their condition and you ought to be able to tell." "Why, how can I tell?" "Well, go out and see, see how close you can get to it." Then I bethought me of my old trick of feeling of the hide; it used to tell me so much toward whether the cow was just the right temperament or not. So I went over the two lots. They brought out one of each kind, and I saw there was a decided difference in the feel, but I couldn't tell which way the thing pointed. Finally I made a stab at it, and said, "Well, I think that one is the one fed on the wide ration, and the other on the narrow." He said, "You are wrong, it is just the other way." "All right," I said, "now, bring on your cattle." He brought on the cattle and from that time I didn't make a miss; I told him which one had the wide ration and which one had the narrow, by the feel. He was thoroughly puzzled, said he couldn't understand it, and there were others present, and they said to me, "Tell us how you get at it, describe that 'feel'." Why bless your heart and body, whoever heard of a man describing a "feel"? Who ever heard of a man describing a "smell"? Whoever heard of

a man putting taste into words, except to say that it tastes sour, sweet, or bitter?

We need to go into our stables and study these cows, and study them from the standpoint of all that we can find out about them, and if a man studies he begins to find that the "feel" of his cattle will bring light to his mind, but he can't put it in words.

Now, gentlemen, I have given you a hasty little talk about some of the foundations of judgment in cattle. I want to say to you that if you go into the development of the cow toward making her a specific dairy cow, she takes on more and more the dairy shape; if you go on developing the cow into more of a beef temperament, she takes on more and more the beef shape, and so this form is an indication whether this cow belongs in the category and class of dairy cattle or not.

She may have a perfect frame and be an imperfect animal. I have a cow in my herd to-day, the daughter of the poorest Guernsey cow I ever owned, and that cow is one of the finest in my herd. Sarah of Jefferson was a well bred cow, but for some reason or other she couldn't make over 225 pounds of butter, no matter what I did. I bred her to a sire by the name of Espanore II., and it brought me this beautiful heifer Bernhardt. I was advised not to keep her, but I said, "She has great power." When she came to her two-year-old form, she gave me not quite 300 pounds, and then she gave me over 400 pounds of butter fat the next year. Now, from whence did she get her power? She got it from her father largely, because sons take from their mothers and daughters from their fathers; that is an old principle in breeding.

And there are many farmers who lose out on the proposition that the mother will convey her good qualities to the coming daughter.

Gentlemen, I might talk all night and you wouldn't be any wiser nor I either, so I better stop.

DISCUSSION.

Mr. Everett: Can't you make it a little more clear as to why a cow cannot be highly profitable in both directions? Explain a little, why the two functions are at war and they cannot both predominate in one cow.

Ex-Gov. Hoard: Sure. There is a great fallacy existing among our farmers, and a certain class of breeders that are very anxious to have it exist. We have a class of men today that are breeding beef cattle and are telling you that they belong to the milk strain. Do you think a man would bring you a draft horse and tell you he belonged to the speed strain, and if he did, what it would it be worth to you? I don't think you would buy him to make a race horse out of him. Suppose a man brought you a bulldog and told you that he belonged to the greyhound strain. Oh, the world is full of inconsistencies. Now, the beef temperament is just as distinctively by itself, as it can be and the milk temperament is just as distinctive. You undertake to unite them and they begin to war with one another. Now, that doesn't say that Nature, once in a while, doesn't make a sport. Once in a while you will see a beefy cow that is giving an abundant amount of milk, but take them through, by and large, see what you can get out of a thousand or five thousand cows, and you will find that the beefy bred cow is a disappointment and a snare when it comes to doing dairy work.

Mr. Goodrich: I want to tell you about Rose. She was a pure bred Shorthorn, and had been bred for thirty years in one line. Her owner selected those that were the biggest milkers; the grandmother of Rose, the woman that owned her said they used to call "Old Bones," because she never would grow any flesh.

Now, I want to say something on this question of judging cows, because it is a very important question. There are a whole lot of us that want to buy cows and we want to know by the looks of the cow whether she would be a profitable dairy cow or not. Governor Hoard has told us a lot of things, but I want

to ask him, is there a difference in the bony structure between the dairy form and the beef form, or is it just in the covering that is over the bones?

Ex-Gov. Hoard: Well, I am very strongly of the opinion that there is a difference in the shape and form of the structure of the bones.

Mr. Goodrich: If that were not true, see what would happen; all we would have to do to make a dairy form out of a beef animal would be to feed it poor enough and reduce its flesh to simply covering of the frame. Isn't that so? A great many years ago, when I was young, I was called on to judge dairy stock at different fairs. Five years ago, I went to Michigan in the Farmers' Institute work and when I reached Lansing, Professor Smith telephoned me in the morning before I got up to come down to the Agricultural College. When I arrived at the college he said, "Come right along," and he led me into a room there that had three cows in it and there were a lot of students, some of them owned farms and some had been in the dairy business a good while. He said to me, "I want you to talk to these boys about these cows and judge them, put each in its proper class." Well, I did the best I could and then they began to shoot questions at me, and I tell you they were sharp, and they shot this same question at me: Is there a difference in the bony structure of animals or is it all in the covering? Prof. Smith and Prof. Shaw were both teachers there of those dairy students, and I noticed that every one seemed to hold his breath while I was considering just what to say. I said, "Yes, I think there is." And such a shout went up, it really frightened me, I didn't know what the matter was. Prof. Smith said, "Don't be scared, they won't hurt you." But it came out that Prof. Smith had told them it was all in the covering, that nobody could tell by the bones of the animal whether it was a beef animal or a dairy animal, while Prof. Shaw had talked differently, so I was on Prof. Shaw's side.

Prof. Smith told us then, "We are going to know about this." And he told us that Bell Sarcastic had been a magnificent dairy cow, she was tuberculous, and they were going to slaughter her, and a beef cow, and they were going to find out. I asked

him when they did that to write to me and tell me if there is any difference. He hasn't written me anything about it yet. Now, I suppose you want to know, as those boys did, what is the difference. It is one of the things the Governor spoke of; it is the spring of the ribs just as true as you live. A beef animal's ribs come out in this way, (indicating with his hands) and it leaves a broad place to pile on meat, while a dairy cow's ribs come down in this shape more, come sloping down. Well, these boys pressed me, they asked me what should make that. Well, it is hard to tell sometimes what causes it but I have a theory, and I give it to you for what it is worth. The work that an animal does, does affect that animal's form. The work that a man does affects his form; the work that I did when I was a young man has affected my form and I know it. The work that a cow does affects her form; the cow that is a good milker is of course a very heavy eater. She carries a large amount of feed, besides the young. Well, somebody says, "But the beef cow does the same thing, doesn't she?" Yes, but the beef animal has a lot of muscle right along here that acts as a brace to hold those ribs. The dairy cow is without those muscles, at least so large, to hold up that weight, and the tugging down year after year and generation after generation has modified the form.

Then here is another place where you can see the difference between the beef and the dairy animal, this backbone here. You can see the bend of the ribs here on this cow and how high it is between. With a good Shorthorn cow you can lay your stick from one hip across to the other and it will barely touch the backbone and sometimes it doesn't.

The Chairman: We will find out more about these things at the University pretty soon.

Ex-Gov. Hoard: We hear a great deal about "nicking." Suppose that you have a sire of strong, decided dairy temperament, like a Holstein or Guernsey, and you have a female of strong, decided beef temperament. In mating them, what are you doing? You have warring elements there, a "nick" that is in constant warfare, one of these elements with the other, and that is not right breeding. What is the average farmer in

Wisconsin doing? He will start first by breeding his native cow to a Shorthorn, because he wants size. Then after a few years he will breed to a Holstein, in order to get quantity of milk; then he will breed to a Jersey to get richness; then he will breed to a Guernsey to get color and after fifteen or twenty years, what kind of cattle will he have?

A Member: Hash.

Ex-Gov. Hoard: Yes, that's it, and I have found thousands of farmers doing that very thing.

There is a certain vigor that comes from crossing; for instance, I never have seen any such pigs as I have been breeding for the last three years, thoroughbred Berkshire sire for two years and then they were bred to Poland-China for two years more. But of course they are allied breeds, there is no war between them, and I have had wonderfully strong pigs.

But in the dairy we are breeding for one specific product which is milk, and our farmers must breed in straight lines.

I have been taking cow censuses for twelve years, I have spent over $4,000 in trying to get at this judgment from the broad standpoint and there are altogether too many farmers in this country who pay no attention whatever to the dairy heredity of their cattle.

Mr. Everett: Gov. Hoard spoke of the circulation of the blood. The wise men who breed beef animals, know that it is expensive to develop certain qualities in them. She has a small udder, because she has no use for a large one; the dairy cow hasn't a broad back, it would cost money to keep all that warm. The dairy cow must be protected; the beef cow stands out in the blizzard and don't care very much about it. She doesn't require the same big circulation that the dairy cow does. A cow cannot give thirty or forty pounds of milk a day and put beef upon her back at the same time, the two functions are at war, but men cannot see it. I got a letter the other day from one of our subscribers who took me to task severely, because I advocated better cows and the growing of larger crops. I said that I had made more money farming by growing larger crops and by making more milk from my cows, but he said I was all wrong; he didn't want to work his family to death growing

bigger crops. What he wanted was not bigger crops but more money for what he grows.

Mr. Luchsinger: There is one indication of a good dairy cow that dairymen pay a good deal of attention to, and that Gov. Hoard did not touch on, and that is the so-called large vein on each side of the body.

Ex-Gov. Hoard: They are called milk veins, but they are not milk veins.

Mr. Luchsinger: I understand that, but do not those veins really indicate something?

Ex-Gov. Hoard: They indicate a very large circulation of blood in the udder, and the milk being secreted from the blood you get your judgment secondarily. The large milk veins indicate very large circulatory action of the system toward the udder, because milk is secreted from the blood and these veins carry the blood from the udder, not to the udder. I shall publish in a few weeks cuts illustrating this whole circulatory system of the cow. A great big artery starts from the left ventricle of the heart and runs along up here and branches out, and then from that again a great many veins run to the udder. Of course the blood that is carried to the heart must be taken back. There is more circulation to that udder than to any other portion of the cow's body, proportionately, except to the heart and lungs.

Mr. Goodrich: You notice a cow that has never given milk and these veins are not prominent. But what do you think of the milk wells, the openings through which the veins pass back into the chest? Doesn't that indicate that Nature has provided for a large circulation there?

Ex-Gov. Hoard: Sure; Nature has built the frame to suit the form. She has large holes there where the veins are large and she has made small holes where the veins are small. In all these things, Nature builds in proportion as she calls on the animal for a function to perform. Nature has wonderful constructive power when you give her a decided function to work upon, but go and mix up her functions and see what she will do.

Mr. Ellsworth: I come from a locality where we must of

necessity depend upon the sire we can get, but I want to ask what class of cows, presuming we use pure bred sires, will produce the best results? I have heard men say that their mares were an excellent breed of mares, because they produced colts like the sire, and that always satisfied me that the mares were scrubs. Many of our men think they are raising the best dairy cows by using pure bred dairy sires and crossing upon such animals as our friend here calls "hash." I would like to have some light on that proposition.

Ex-Gov. Hoard: You are up in that community in Barron county. You have to use what the farmers have. My observation is that a native cow, a mixed sort of a cow but pretty fairly good milker, coupled with a pure bred dairy sire, will produce a great improvement on the mother, because she has not an opposing prepotence in her tendencies; consequently she is more receptive. Here comes in this strong, prepotent tendency in the sire and takes possession of her blood, and gives to you a much better result than if you took for the mother one that had a strong prepotent tendency toward beef. That stands to reason, because then the two prepotencies would be warring all the time. You would not get so large a proportion of improvement in the subsequent crossing as you did in the first. You take a first cross, and you see a wider distance between the mother and the daughter. Then breed the same daughter again right along in line with the same line of blood, and then weed out, and you have a well graded up herd. With all strong heifers I would inbreed once with grade cattle, then you get a three quarters in-bred. Then, that mother would be almost as responsive to the sire's blood as though she was a thoroughbred. She could not be registered, but she would be wonderfully responsive; there would be no warring tendency between the mother and the father. The real science of breeding is to harmonize and put like with like. Now, you take an ass and a horse and you get a mule. But what does Nature do in this case? Stops right there, she denies any further procreation. In breeding, men should stay right by one breed, all the time breeding with a prepotent sire, and do not stop for a few

dollars, stay right there. Don't go and mix them up. Mr. Goodrich started with Jerseys, weren't they, Mr. Goodrich?

Mr. Goodrich: They were grade Shorthorns, most of them, but my best grade cows came from an Ayrshire.

Ex-Gov. Hoard: Ayrshire mixes finely with pure bred Jersey or Guernsey. What was your average production, Mr. Goodrich?

Mr. Goodrich: The first year I kept account there were 150 pounds of butter per cow. I went on till I got 366, and one-third of the herd was two and three-year-old heifers and finally I reached a production of 400 pounds or over.

Ex-Gov. Hoard: And that came from grading and weeding out.

A Member: What would be the matter with changing sires from one breed to another, say, Guernseys and Jerseys?

Ex-Gov. Hoard: The Guernsey and the Jersey are what might be called kindred cattle, but the Holsteins are so widely away—suppose I am going to have a Holstein grade mother and I take a Guernsey or Jersey father, so as to get the quantity there is in the Holstein and the richness there is in the Jersey. That is a very fine thing to hope for, but they are rarely produced. The result has been by those who observed it, that the resulting progeny are no where, because there is no harmony between the prepotency of the mother and the prepotency of the father. Between the Guernseys and Jerseys there is much more harmony, both having been bred for butter, but I would not advocate mixing them as a rule.

A Member: What about the Berkshire and the Poland China?

Ex-Gov. Hoard: You know the Poland China came from Berkshire, and the Chester White; the original Poland China goes back to Berkshire blood, and so they harmonize very well when you bring them together. Now, the Berkshire has an exceedingly great vigor, he has the strongest bone, he is very muscular. The Poland China has a tendency toward excessive fat and besides that the Poland China sow is apt to be too refined. I only breed to turn them over, you know. I was not breeding

for purity of blood at all. I knew that with hogs you must be careful about inbreeding, at least I thought so, and so I said I will buy a Poland China sire, use him for two years, then a Berkshire for another two years; and I have got a very fine lot of pigs in that way, but I think it is partially due to the fact that every single one of the mothers, from the time she was bred until she farrowed, was kept on alfalfa hay, nothing else. By crossing, I have helped the vigor of my pigs. When I first started in I kept my nine brood sows on alfalfa hay until they farrowed, nothing but that and their drink. My foreman said they would starve, but they went through the winter in fine shape and brought me seventy-eight pigs, and I fattened and sold seventy-five.

Mr. Luchsinger: How does the Governor explain the fact that in Green county the Holstein dairy breed is the favorite, or becoming so, while in Jefferson county it is Holstein or Jersey?

Ex-Gov. Hoard: Now, Mr. Luchsinger, can you tell me why a large part of the farmers in Green county married Swiss women?

Mr. Luchsinger: They were looking for wives and married Swiss girls.

Ex-Gov. Hoard: Isn't that a very good answer as far as it concerns Green county? In Jefferson county you won't find men marrying Swiss girls, they marry Germans. When it comes to the question of the taste men will exercise, their taste in women anyway, all the talk in the world won't stop them, and in cattle it is the same thing, when it comes down to the proposition of choice, it is a matter of taste. It is a matter of taste with me; I like the Guernsey from the standpoint of my taste, but I believe the Holstein cow is one of the finest cows on earth; I am bound to believe that, because she proves it. I know that my wife is one of the finest women that ever bore children to a husband, and I have three handsome boys to prove it by, too—they look like their mother. I haven't had a chance to show what my daughters could have done.

The following gentlemen were named by the chair to serve on the various committees:

Committee on Nominations: C. P. Goodrich, C. L. Hill, S. J. Stauffacher.

Committee on Resolutions: J. Q. Emery, C. H. Everett and W. W. Chadwick.

Auditing Committee: C. L. Hill, J. T. Atwater and U. S. Baer.

Convention to meet at 7:30 P. M.

EVENING SESSION.

At the evening session, which was in charge of S. J. Stauffacher, after a few words of welcome by that gentleman and prayer by the Rev. W. Auser, the following program was enjoyed:

Music by the orchestra, in charge of Mrs. Nettie Booth Wegg.

Vocal solo by Miss Gardner.

Recitation by Col. C. S. Young.

Milk-Maid Chorus by the high school girls in charge of Miss Gardner.

DAIRY MAIDS' SONG.

We have come to you tonight,
With our shining milk pails bright.
U Rah Wisconsin!
To sing your praise and fame,
And the glory and the gain
To every farmer in Wisconsin.
And if the grand advice you've heard
You'll write on Memory's slate.
U Rah Wisconsin!

'Twill double up your business
And will glorify the state.
You bet your life it will.
We come to you tonight
With songs and with music bright.
Good times, bright times
Follow in the wake of milk and cheese.
For Hoard has come to tell us
The things we ought to know,
To profit by his counsel wise
You surely won't be slow.

O'er the milky way he's traveled
Years thirty-six or more.
And every farmer in the land.
Has gained in wealth and store.
The future gleams bright and true,
May it bring luck to you.
Honor and praise is due
The man that brought the cow.
Ring, ring, ye cow-bells, ring,
Sing, sing, ye milkmaids, sing,
We'll raise our chorus loud and strong
For gallant Tom.

You must be nice, you must be neat,
Keep your shining milk-pails sweet,
Clean the rubbish off the ground
When Marty marches round.
Ring, ring, ye cow-bells, ring,
Sing, sing, ye milkmaids, sing,
And raise our chorus to the breeze
For milk and cheese.

ADDRESS.

HON. W. D. HOARD, Fort Atkinson.

Ladies and Gentlemen: I am no more fit to make an address than I would be to court all those beautiful milk-maids. Their inspiring presence, their dainty ways, their beautiful music has put all sober enunciation out of my head, and I am a boy again, after the girls. I did not suppose, Gen. Burchard, that there was so much of the old time inspiration left in the sober and prosaic dairy business, as we have listened to tonight.

I have attended every meeting of this Association but one since it was organized, thirty-six years ago, and in all that experience,—the Wisconsin Dairymen's Association has never had presented to it as graceful and pretty a compliment as we have received tonight. I am surprised. I was not prepared to believe that in this little city of Monroe there was as much genius and sentiment as I have seen and listened to to-tonight, and the idea of asking an old fellow like me, full of recollections of his youth, to make a speech,—why, I simply can't do it. I have a good notion to cut loose and tell a story, and if I do, I want you to understand there will be neither rhyme nor reason in what I say.

(After delighting the audience in his inimitable way, with a number of "stories", the Governor continued.)

I want to say one sober thing before I close. I wish that the good people of Monroe could see in one clear, straight presentation what the meaning of this convention here is. I wish the good people of Monroe could understand what part this great dairy interest plays in the destiny of the state of Wisconsin. Last year we passed through a great panic, one which has not been equalled since 1857 in some particulars, and yet let me say to you that the great agricultural interests of the state of Wisconsin do not know it to-day. The dairy industry of the state did not know it in 1893 when the manu-

facturing and the commercial interest of the county were suffering severely; all of those sections which had been devoted to the cow sailed as calmly and as serenely through the storm as though they had been an argosy freighted with flowers. Not a single tremor passed through the districts devoted to dairying.

Again in 1907 came a great paralysis all over the body politic, profoundly affecting all the industries of the country, but every dairy district of Wisconsin has stood like a rock; the commercial interests of Monroe, of Fort Atkinson, of Sheboygan, every district in the state, where there was a strong cow population, sailed along steadily as they are doing to-day.

What does this mean to the schools? What does it mean to the social conditions? What does it mean to those things we call the civilization of our day, and which are built solidly and serenely as upon a rock? That is the reason why we come together year after year and have been doing so for thirty-six years, and struggle for the dissemination of knowledge, striving the best we know how to get the farmer to understand the meaning of his own salvation, and to-day Wisconsin assumes a proud place. The ladies who sang to us tonight about Wisconsin had in their utterances, almost, I might say, the gift of prophecy. Her College of Agriculture stands to-day without a peer in all of the United States; no such work is being performed anywhere in promoting agricultural culture as is being performed in Wisconsin by the College of Agriculture.

Last winter I had the pleasure of standing in Madison and addressing six or seven hundred young men belonging to the Experiment Station; young men who have graduated from the Short and Long Courses of the College. The other day I asked Dr. Russell to come before the Board of Regents, because I wanted him to present a graphic picture of what the college was doing, and he brought in a map dotted in such a way as to show where every young man is located who is engaged in the experimental work on barley, alfalfa and corn. That map showed that there are to-day over 1,000 young men in Wisconsin engaged in experimental farming under the leadership of the college, and each one of them is a culture center in his own locality, disseminating by example and by precept and in all

manner of ways the knowledge he has gained at the College. Think what that must mean to the agriculture of Wisconsin.

Then again Wisconsin is becoming a wonderful stock-breeding state; my own little county of Jefferson twenty-four miles square, last year sold over a half million dollars worth of dairy cattle besides two million dollars worth of dairy products.

Let me take you, in imagination down to the old township where I was reared in New York and where I saw farms once sell for $100 an acre. I can buy them today for $30 and $40 an acre. A farm of 358 acres, with $50,000 worth of buildings on it, was offered to me by the Bank of Syracuse for the face of the mortgage, $10,000.

Now, what makes the difference? Why is Wisconsin to-day with a constant appreciation in the value of her farm lands, and what is the matter down in New York and New England where such farms are abandoned? It has been stated on good authority that the state of New York in the past thirty years has lost over $130,000,000 in the decline of the value of her farm lands, while Wisconsin has been constantly appreciating. The Yankee farmer has been truthfully said to be a destroyer of forests and fertility. From the time he started on the Atlantic Coast until he reached the Rocky Mountains, the Yankee farmer has been constantly going west to destroy another country, but fortunately for the nation the German, the Scandinavian, the Swiss or the Bohemian farmer has come in and taken his place, and wherever those men have settled you see at once a growing appreciation of the price of farm lands. And do you know the reason? Let me tell you; go back to the homes of these men, back to Switzerland, to Scandinavia, to Germany, go where you will on the continent in Europe and you will there find every government teaching its little boys the elements of agriculture in the common school.

It was not taught to me, no, nor to my father; those foundation things have been forgotten, overlooked, and New York has suffered in consequence to the extent of $130,000,000, and so I preach to you tonight, the people of Wisconsin, that this is one of the things we must do. It is written in the destiny of our state that we must take hold of the school in the country, the

school in the city, in the village, the high school, everywhere we must begin to teach these people the elements of agriculture.

In my little paper, we have a department of inquiries and answers. We there construct rations, give advice and answer questions concerning the life of the people to whom the paper goes. We have to use scientific terms sometimes; for instance, there is no equivalent for the word "protein," and so we must use that word, and the same with "carbohydrates," and we found that if we were going to use these terms in making up rations, that some of our readers would not understand them, and we had to go to work and construct a little dictionary, called a "Glossary," putting these terms into as simple words as possible. Now, if the state of Wisconsin had done rightly by these people and had taught the meaning of these things in the schools, that would not have been necessary.

We need to change our methods and give our people, our children, a practical education, so that men will be enabled to understand the literature of their business. The trouble with our schools is we are trying to give a fifteen cent education to $1,500 boys and girls; too many of them have crammed into them, things they can never make use of, while they are sadly lacking in things they need every day of their lives. Knowledge that no man can use is without justification, either by faith or works, and so I say tonight that we must take hold of this proposition and begin to teach the elements of agriculture in our common schools.

Selection by the Harmony Club.

THE RELATION OF THE FARMER TO THE PUBLIC SCHOOLS.

A. F. Rote, Monroe, Wis.

What I have to say upon this question this evening will be but a few words strictly from the standpoint of the school teacher.

The farming community of this country comprises considerably over half of our population and is an exceedingly substantial body of people and certainly the form of public school education that they have, should be thoroughly up-to-date and equal to that which we find in existence in our cities.

The public school system that we have today is quite largely an American institution, especially that feature of it by which it derives its support by means of general taxation. It started in the eastern part of this country, and I think Horace Mann, who has been given the greater part of the credit for originating the idea, his idea was to provide by general taxation for the general education of the young people of the city in which he lived. That city was accordingly divided into districts and a common school course of study was inaugurated, which is very much like our present district school system. That has spread as the people have immigrated from the eastern states until it has covered all the northern part and a great deal of the southern part of this nation.

At the same time the higher education that was given in the towns was partly through a system of schools called academies, and as these people moved west and spread over this country and new cities grew up, towns and villages, they immediately provided that education for their children, but they had no way of providing for higher education, and consequently after a time there rose the high school, as we have it.

Now, the growth of the high school system in this country has been phenomenal, and taken together with the rest of our public school system, gives us one of the most perfect systems any country can have.

There have been several changes which have taken place in comparatively recent years, and they are of two kinds, the first, as the cause of the second. The course of study followed in the old academies was a good deal such as to give general culture and prepare a man to become a minister or a lawyer or physician, but the high school academy, as it passed into the high school, passed under the control of the public altogether, changed its course of study, and turned it into a more practical trend. In the first place they became more scientific. I can remember when the elements of science were first taught, and now they are teaching various kinds of practical knowledge.

The State Universities grew up likewise, giving us a complete system of schools.

The State University, when I attended it, was largely a college; the scientific side of it has grown enormously, expanded in a great many ways, and it also carried just two lines, on the one side that which is purely theoretical, and on the other, putting theory into application, and subsequently along with the instruction of sciences has developed the practical work, the machine shops and laboratories.

That idea has come down into the high schools, and the high school courses have been modified accordingly, and in the last fifteen or twenty years you will find all over this country, all the high schools nearly have been replaced and new buildings built to meet the new demands of the new courses of instruction.

One of the most remarkable changes in the university has been the expansion in the courses of agriculture. When I attended there, there was one lone student in agriculture, and he was the butt of a good many jokes.

The point of what I am trying to say is this, that the cities, aggregations of people, have been able to carry out this common school which has taken the place of the Eastern Academy, and they have comparatively little trouble in raising the necessary funds. The farmers, in the country, scattered as they are, have nothing but the district school, and I can't see how they can get anything else unless they lay aside the district school system. There has been a great deal of thought expended upon this subject by very capable persons, and the legislature, at its last

session I believe, passed some laws looking to the betterment of the rural schools.

Now, one of the methods to which a great deal of attention has been turned of late is the idea of consolidating them and providing teams to carry pupils to and from school, those who live more remote. The idea is to bring enough districts together and furnish property and teachers enough so that you may have a school which is adequate to the needs of those children and one adapted to the teaching of agriculture.

Agriculture has a great many departments, and I am not going into that this evening. The farmer is so related to this public school question that if he wants to get higher education than the three "R's" for his children, he must either send them to some city school and pay their board, and I don't think that is altogether the best thing for a child that is not old enough to turn away from home for four consecutive years, or else he must put a tenant on his farm and move to town himself if he wants to give them the advantages of a more liberal, a higher education; or they must consolidate their districts and build a joint high school and provide the means. The latter, a great many think, is the most feasible. This idea is taking hold in other states, and it is the burden of what I have to say this evening on the relation of the farmer to the public school. I might say that in Ohio, where my brother lives, this question came up. A certain gentleman had acquired a competency and he came back to this town where he was a boy and built a $25,000 high school building and equipped it with the proper machinery, etc., so that there was taught there, cooking, sewing, manual training and all other branches that they have in high schools. The children are transported quite considerable distances to this school and it doesn't cost much more than it cost the government to run a couple of mail wagons. When this question was first brought up, a great many people scouted the idea of hauling the children to school, but it is being done, just as the mails are being hauled by the government, and it has been found to be a practical, good thing.

Musical selection by the High School Glee Club.
Music, the orchestra.
Adjourned to Thursday morning, at 9 A. M.

Convention at 9 o'clock, Thursday morning.
President Gillett in the chair.
Report of Secretary was offered as follows, and adopted:

SECRETARY'S REPORT.

To the President and Members of the Wisconsin Dairymen's Association: I have the honor to submit the following report, covering the period from the adjournment of our convention in Tomah last winter to the present time.

The report of the Treasurer, as published on p. 189 of the convention proceedings for 1907, shows a balance of $8.12 in his hands. He has since been charged with $5,000.00 received from the State Treasurer and $202.00 received for memberships, making a total to be accounted for of $5,210.12. I have drawn orders against this sum to the amount of $4,066.25, which leaves a balance of $1,143.87 in his hands according to the books of the Secretary.

A summary of the purposes for which the expenditures were made follows:

Convention expenses of 1907.....	$554.63	
Convention premiums paid.....	48.00	
		$602.63
Dairy Inspector, H. C. Searles, 354 days, organizing cow testing associations	$1,062.00	
Expenses	818.84	
		$1,880.84
Dairy Inspector, H. K. Loomis, 49 days	$245.00	
Supplies	1.63	
		$246.63

Expenses of the members attending meeting of the Executive Board...	$31.40

SWISS CHEESE PURPOSES.

Instructor Peter Zumkehr, 245 days..	$1,225.00	
Printing report	75.00	
Supplies	4.75	
		$1,304.75
Total		$4,066.25

There still remains to be paid as a part of the legitimate expenses of the year, the salary of the secretary, $250.00, the expenses of his office $65.30, W. D. Hoard Co. for stationery, programs, etc. $30.80, and several outstanding accounts for traveling expenses of several officers while serving the Association. When these several accounts are presented and paid, the expenditures for the year will be in the neighborhood of $4,500.00.

There remains with the State Treasurer to the credit of the Association $5,000.00. Of this sum $1,797.23 is held in trust to be expended under the direction of the Southern Wisconsin Cheesemakers' Association for the benefit of the Swiss cheese industry.

As it is expected that Dairy Inspector, Mr. Searles, will submit a report covering his work for the year in organizing cow testing associations I forbear to enter into the details of that subject.

I am satisfied, however, that Mr. Searles has been doing a very valuable work, more perhaps in the way of sowing good seed than in reaping the harvest. It has been my effort to have him visit as many different localities in different portions of the state as possible, and the reports which I have received from various sources show that he has been very earnest in his work, has aroused a good deal of enthusiasm in the matter of organizing cow testing associations and recent demands for his services have been more than could receive attention. It is my

opinion that this work should be carried on and if possible enlarged. Other states are taking up the work and Wisconsin certainly does not wish to be left in the rear in anything that will tend to the development and improvement of our dairy industry.

I am persuaded that my duties to myself and my family, and to other imperative engagements, compel me to tender my resignation as your Secretary; or, perhaps more properly, to say, that I do not wish nor can I consent to be re-elected Secretary for another year. There are others who can devote more time to the office and the infusion of a little new blood and ambition will, I am persuaded, make for the wider influence of the Association. My heart is full of gratitude to all the members of the Association with whom I have been associated and especially to the members of the Executive Board.

Respectfully submitted,

GEO. W. BURCHARD,
Secretary.

TREASURER'S REPORT AND REPORT OF AUDITING COMMITTEE.

MONROE, WIS., March 12th, 1908.

To the Wisconsin Dairymen's Association.

Gentlemen: The Auditing committee appointed by your body to audit the accounts of the Treasurer of your Association, begs leave to report that we have examined the accounts of the Treasurer, comparing the vouchers with the book, and find same correct.

CHARLES L. HILL,
J. T. ATWATER,
U. S. BAER.

(Adopted.)

MILK FROM THE PRODUCER'S STANDPOINT.

JOSHUA KLASSY, Monroe, Wis.

Mr. President and Gentlemen of the Convention: My theme on which I am to speak to you today is the subject of milk from the view of a producer. It is not necessary for me to say that I am no speaker, and not used to addressing meetings of this kind, for you will all find that out long before I am through; but a producer of milk, I may truly say, I have been all my life. As far back as I can remember, I was taught to handle the teats of the cow, and as I am getting near the danger line of age, I may say I have seen and done my share of it.

Now, I am no theorist, although I will admit that theory is a very good foundation for practice to build on, but I have always been what is called a practical dairy farmer. As far back as forty years ago we used to milk cows and derive more or less benefit from them, usually less than more, for with butter at six to ten cents, it was not a very paying business, and at that time we did not care so much whether a cow gave a large amount of milk which was thin, or a smaller amount containing more butter fat; in the end it amounted to the same thing anyway. But very soon cheese factories sprang up about us, milk became of some value, it was something that was marketable, although far from the point that it is now at, but when we commenced to realize two hundred and fifty to three hundred dollars annually from our dairy, from which we derived hardly a hundred dollars before, we thought we had struck a bonanza, and, as is generally the case, decided to make the most of it. Now the question became a vital one, we commenced to figure that a cow yielding four to six gallons of milk a day was a more valuable animal than one that only yielded a gallon or two, and such were relegated to the rear and reserved for beef, and from the mother cow, that was a good milker, we would save all the calves we could, while the others died untried. More and more the dairy continued to give the farmer good returns, more cows

were kept, larger compost heaps were accumulated to be hauled out and spread on the land, to return to it some of that which was taken from it, and very soon we began to realize that the dairy business not only gave us larger returns in dollars and cents every year, but our land became more productive and hence more valuable as the years rolled by, so that our hard hilly farms became as valuable as our bottom lands.

Now, the question came very naturally, how to keep and increase this business, which we found to be so profitable, sixty and sixty-five cents per hundred pounds of milk worked wonders with us, and we strove hard to increase our product from our cows, and also were able because of the better condition of our land, to increase the size of our herd. We commenced practical researches, as how it was best to keep our pastures in such shape that our cows could have fresh grass during the season as long as possible, and when the frost set an end to that, we helped out nature with what she generously provides us with, if we took care of the opportunity she offered, and late planted corn-fodder, either green or already in shocks, were fed to our cows to keep up the flow of the milk. In those days about six months was the cheese factory season, commencing with the first of May, seldom earlier, and lasting until November, and if the weather was favorable, we would continue for a while until the flow of the milk was so much reduced that the delivery did not pay any more. Not so much attention was paid to hay and other feed, as we naturally do now, under changed conditions, for I deliver my milk now to the condensing factory, and as the factory pays the highest prices in winter, it is to our best interest to keep up the flow of milk during that time, as well as in summer, and as pasture is wanting, and the cows have to be stall and barn fed, other conditions had to be met, and we have to see to it that something else is added to the dry hay to increase the flow of milk. Of course, I am very careful in the selection of my hay for the milk cows, as I have a large amount of hay to cut; the first cut is very young and tender, and when well dried and cured is an excellent feed for milch cows. Then, again, the second crop if taken before the frost takes it, is the finest thing that can be had in the shape of hay. And that is all set apart

in the barn to feed my milk cows. If that does not suffice, or if we do not have enough of that kind of hay, we feed a little grain, oats and corn, or bran mash, and find that it pays very well. In the summer time we are as careful as ever to change our pastures as often as possible, never letting the grass grow too long and rank in any one, before we drive our herd into it, for when cattle have eaten over a pasture for a few days as cattle will roam over the entire area at once, it is better to have smaller and more pastures, and the oftener it is changed, the better it is for the flow of the milk, for the pastures and the cattle. One great consideration is very often lost sight of by the farmers, cows should have free access to fresh, clean, pure water, not too cold and neither too warm. Stagnant pools where the water in the hot sun gets warm and forms green scum and turns black from stagnation are to be avoided. Not only does it injure the natural flow of milk, but it injures the milk and also the cow, and more milk is and more cattle are spoiled and ruined through scanty or poor water than through poor feeding and lean pastures.

Another great consideration is to keep your cows warm, but not too warm, with plenty of good air. A cow which is compelled to breathe the cold, chilly, untempered northwind, or the foul air of an unventilated warm barn, cannot thrive, nor can she give her natural quota of sound, pure, healthy milk, and hence these nuisances should be disused and abolished.

Above all, whether you send your milk to cheese factory or condensing plant, the utmost cleanliness should prevail. The condensing plant has established certain rules for its patrons, who at first thought they were too rigid, severe and unnecessary, which should be enforced everywhere among the dairy men, for this is the greatest consideration of them all. You cannot produce good, healthy, clean milk, unless you keep your barns, your cows, your milking apparatus, including the persons who attend to the milking, conspicuously clean.

As far as the kind of a cow to keep, which will give the largest yield, and is the most profitable, the opinions are as variable as the persons themselves. Some of our dairy farmers think that the Holstein-Freisian is the best, and others prefer

the Jersey, the Ayrshire, and some like myself the Brown Swiss. This may be more or less a fad with us Swiss people, out of pure love and affection for the country of our birth, so that we have something to remind us of it. Although I was a boy of tender years when I came to America, I still preserve a sort of loyal remembrance of my birth place, Switzerland. And it may be one of the reasons that my herd consists largely of Swiss cattle, and grades, although I still have some of the old Durham stock among them, and I may say that I am satisfied with the yield they give me. Now, my herd being so large, I cannot give my especial attention to each cow, and have to depend a great deal on my employes, but still from time to time I make a personal inspection of each animal to see to it that they are properly cared for, and above all, properly milked, for this is a source of great evil, for hasty and not sufficiently thorough milking has spoiled many a good cow, for if a cow is not milked clean, that is, that the udder and teats are not entirely evacuated, the milk remaining can never be brought out again, and the flow will become less and less with the same process of milking, and the milk spoiled in the udder.

There is no question whatever that good care and judgment should be used in the selection of a proper breeding animal, or in case of a large herd, several. Where farmers are situated as I am, that is, are patrons of the condensing plant, where milk is needed all the year through, and not only through the summer months, it becomes necessary that your cows should come in all through the year, and great care has to be exercised in that particular. There are a number of dairy farmers, patrons of the condensing factory, who simply turn off a cow for which they have paid from fifty to sixty dollars when she begins to run behind in her flow of milk, for thirty or thirty-five dollars as the case may be, and buys another fresh cow at the former figure of fifty or sixty dollars. It is easy to conceive that a loss occurs and I believe this loss is not accounted for in the cow census when they show what their income is from twenty-five or thirty cows, which they may have; their yield or income will naturally be larger, and the income greater, but if they also bring in the losses of trade as it happens in this change of cows

amounting to two or three hundred dollars, their average yield and income will be much smaller. But every one to his own notion. I would rather raise my own cows, and then I know what I have, than go and buy at every farm and cow sale, strange cows. Some may see profit in it, I do not. All I can say is that by proper care, and such judgment as I possess, I have made a fair success of the dairy business, and although I bought my land at a high price at the time I bought it, it was a paying investment, and I believe, if I wished to sell it, I could double the price on it, but I do not care to do so at present, and these conditions were all brought on by the dairy industry and due attention to the same.

I thank you for your attention.

DISCUSSION.

Ex-Gov. Hoard: Do you keep a record of your cows so that you know what they do individually?

Mr. Klassy: No, I don't.

Ex-Gov. Hoard: We would like to know about your Swiss cows. Do you know of any one who has kept a comparative record so as to know what their merits are?

Mr. Klassy: No, I don't keep any record. They give good, rich milk. I understand from all these talks and papers that there are not so large a number of them in this country as of others.

Secy. Burchard: It is worth stating, perhaps, that the Brown Swiss Association of America has definitely determined that they will class their cattle as dairy animals and not as dual purpose animals, and that they will from this time on cultivate the dairy temperament in that breed of cattle.

Mr. Klassy: Yes, they came to that conclusion, I guess about a year ago or so.

Secy. Burchard: And everybody is delighted to know that they have taken that stand; that is, every dairyman is.

Mr. Goodrich: Mr. Klassy, you spoke about giving your

cows a good supply of water in the pasture. How many times a day do you water them in winter?

Mr. Klassy: In the winter time I water my milking cows twice a day, in the morning, about eight o'clock and in the afternoon about four.

Mr. Goodrich: Are they watered before they are fed or after?

Mr. Klassy: They are fed before watering and fed right after, or, when it is very nice, they are watered and fed at the same time; that is, I feed in the barn some, and then turn them out, and if it is nice, feed them some shock corn.

Mr. Goodrich: I never knew till I got to be an old man just when a cow ought to have her water, and I will tell you how I found it out. My son put in his stable, where he had seventy-six head, the Buckley watering device, where a cow could drink whenever she wanted to, and I think the cow knows when she ought to drink better than anybody else does. We found that invariably they wanted to drink immediately after eating. If they were fed three times a day, they would eat their feed and then drink afterwards. I believe that we should follow nature. I do know those cows did better than they did before we put in those watering devices.

Mr. Klassy: Yes, and you want to arrange it so that they do not have to stand and wait, a cow wants to get to her water right after she has finished eating.

Mr. Luchsinger: I have known Mr. Klassy ever since he was a child. He is the largest dairyman, at least furnishes the greatest amount of milk to the milk condensing factory in this country, and what he says about feeding and watering and milking is absolutely of his own practical experience; he has been the most successful dairyman that I know of. Now, referring to the Brown Swiss cattle, it may be that there is a good deal of love for the Fatherland that causes him to have all of his cattle Brown Swiss, but I take it he is a practical man, he knows how to figure, and he knows at the end of the year that his receipts are fully as large, if not larger than those of his fellow patrons who have cattle of other breeds.

I have kept Brown Swiss cattle myself, and I want to say

that if there is such a thing as a dual purpose breed of cattle, which I am not sure about, those are the cattle. We have speakers here who say that there cannot be any such thing. In Switzerland they have been breeding those cattle for centuries right along, both as to color, as to form, and as to milking qualities. They are bred for dairy purposes mainly, but Switzerland being a country which produces little or no grain, nothing which you can feed cattle except grass and as the people do need some beef, they have used this breed of cattle, both for beef and for milk-producing qualities. It may be that when they are brought to this country and are fed the amount of grain that a great many dairy farmers feed, that that beef quality that has been bred in them predominates, and perhaps makes the milk-producing quality somewhat less; I think that is a fact, at least that has been my experience, and I think it has been Mr. Klassy's, that they respond very readily to feeding grain, and the steers of that breed make very good beef; they are a good form for beef, the hind quarters are large and they put good meat on them. But they are a hardy race of cattle and well adapted to this climate. The grades are also very valuable animals. We have bred them upon so-called common cattle of this country and the product is very valuable, both as to constitution and as to milk-giving qualities. Their milk is not so rich as the Jerseys or the Guernseys, but it is good, rich milk, and I think will certainly average higher than the Holstein. I would like to ask Mr. Klassy, knowing that he hauls milk every day in the year, Sundays included, to the milk condensing plant, if he has any record of what his cows average per year.

Mr. Klassy: Yes, I have for several years back, and of course it varies quite a little. You may have a dry summer and if you have you will run quite a little behind a summer that is wet. My cows, since I have been hauling to the condensing factory, are averaging me from $60 to $70 and $75, and I keep on an average about a hundred cows, all my own breeding.

Mr. Luchsinger: I notice you speak about feeding corn and oats.

Mr. Klassy: Yes, but I don't feed very much of it. These

last few years I have been feeding what they call ground wheat screenings.

Mr. Luchsinger: I was figuring up the other day in our town—after talking to some of the farmers coming in, hauling in their grain, and I said to them, "How can you feed oats?" They said, "Why, they are the cheapest feed we can get, because we grow them ourselves." I couldn't help but smile.

Mr. Klassy: I can't understand that. I am selling what oats I have to spare. I can sell them for seventy-five cents a bushel, and I have to get cheaper feed than that.

Ex-Gov. Hoard: I should say so. At present prices a man would be feeding at the rate of over $30 a ton, and yet some of our farmers seem to be bewitched with the idea that if they raise the stuff that it must be a great deal cheaper than what they buy. I bought cotton seed meal the other day in Milwaukee for $30 a ton, and cotton seed meal contains the largest amount of protein of any feed we have. Sometimes I wonder if we are doing as much thinking about the economy of different kinds of feed as we ought to do.

Mr. Goodrich: The milk condensing factories do not allow their patrons to feed cotton seed meal, do they?

Mr. Klassy: I think they do.

A Member: I have one of Borden's contracts and that is permitted amongst other things.

Mr. Klassy: I have read the contract over, but I am not sure whether it states that or not. I remember that it prohibits slops, silage, turnips, cabbage and a lot of other stuff, but cotton seed meal has slipped my mind if I have read it.

Mr. Hill: In lieu of silage do you feed your cows any roots?

Mr. Klassy: No, sir; there are no roots in this part of the country to speak of.

Ex-Gov. Hoard: Do the condensing people forbid the feeding of roots?

Mr. Klassy: I don't think they do. How is that, Mr. Church?

Mr. Church: No, they don't, nor cotton seed meal.

Mr. Everett: Why do they forbid the feeding of silage?

Mr. Church: Well, they find that they can't use milk made

from it and make a product that will keep. They have tried it and have not had good success.

Prof. Henry: I think the records will show that about twenty-five years ago the Borden people in the eastern factory had some objections to the milk produced from silage fed cows. As near as I can find out they are living on that tradition and all the factories in the country are following that old time action and rule.

Mr. Goodrich: In Michigan they don't.

Prof. Henry: The Michigan condenser at Lansing had its experience. They were very short of milk, they couldn't get what they needed and make it profitable. They had one patron that drew a bigger load of milk than anybody else and they had several times praised him for his milk, and they talked about putting up silos, praised the milk from a man that was producing milk from silage fed cows and they have advocated the use of the silo in that milk condenser. I have sent a letter within a week to that company, asking if they are keeping that up.

Ex-Gov. Hoard: That milk that Mr. Gurler sent to Paris, that went all the way from Illinois to Paris and was good for a week after it got there, was produced from silage. It is hard to square some of these things and get the condensing people's view point, and our view point and all these view points together.

Prof. Henry: I drank some of that milk in the city of Paris that was produced on H. B. Gurler's farm in De Kalb, Ills. It was sweet milk and it had nothing but refrigeration to keep it sweet. It was properly drawn and then kept cold all the way to Paris, and I tasted that milk myself. When they put experts on that milk—those gentlmen with black coats and silk hats, about seventeen of them, when they came around, these learned gentlmen, and this milk was shown them—they said, "That is very nice milk." But when Major Alvord said to them, "That milk has never been treated in any way whatever, it is just as it was brought from the cow," they said, "You can't fool us, Major Alvord." He said, "All right, put your chemist on it. If it has been cooked or treated in any way, the chemist

will find it out." But even that didn't satisfy them; they simply declared that milk couldn't keep that long.

Ex-Gov. Hoard: Milk from Mr. Barton's farm, went to Japan and back again.

Secy. Burchard: And that was Swiss milk.

Mr. Church: They claim they don't care to buy milk made from silage, from the average farmer, the way he takes care of it; can't take the chances. Any one who has had experience with silage, knows that it makes a good deal of difference how it is put up, how it is handled. Because our company had the experience that Prof. Henry spoke of in the east, and we concluded it was best not to take any until the farmers have learned how to handle their silage better.

Ex-Gov. Hoard: You prescribe certain rules for these farmers, don't you?

Mr. Church: Yes, sir.

Ex-Gov. Hoard: Why can't you prescribe some rules regarding silage and regulate it?

Mr. Church: We could. Of course if your silage is not right and a man is depending upon that particular herd, you can't get away from it if the silage isn't right. Too much of the silage in this country spoils. We even have trouble where men are feeding shredded corn. They are apt to shred too much of it and leave it piled in a heap and it spoils, and that is not proper feed, but the farmer wants to use it. We have trouble enough with careless feeding of that kind.

Ex-Gov. Hoard: The farmer is debarred by your action from a very valuable and a very cheap feed, a feed that will help him produce milk at a wonderful reduction, because you make him produce his milk in the most expensive manner possible; you take away his profit. Now, it is a question with me whether there couldn't be some way of coming together on this common ground. I approve most heartily of the rules that the condensers establish among the farmers for the care of their stables and their milk; I think the condensers have done more to put sanitary notions into the farmers' heads than any other factor in the country, but it seems to me on that question that they could take the initiative and say to the farmers, "We want

you to build silos about a certain size"—in proportion to the character and size of the herd—and you could do a lot of immensely helpful work in that way and benefit the farmers.

Mr. Church: Where it is produced properly, we have no objection to taking silage milk.

Mr. Marty: What are the possibilities of uniform quality of silage under general conditions? Doesn't it vary largely from one year to another?

Ex-Gov. Hoard: I speak mainly from my own experience and say this, so far as my experience is concerned, that with my silos they have run wonderfully close, year after year, more so than any other form of feed that I have prepared. Hay is often damaged greatly by the weather, but your corn comes along at just such a period, and you can proceed to put it into your silo, and you put it in and it goes through a process of preservation, it is held there and nothing injures it, and it comes out even in its grain and its quality as feed, more so than any other feed, comparatively speaking. I think Mr. Church is correct in saying that they would have some difficulty with shredded corn. It is too often that farmers go ahead and prepare a lot of fodder and pile it into a big bin, or up into heaps, and it is damaged; it molds. Now, good silage does not mold; it may heat and to a certain extent ferments, but the heat itself kills the germ of fermentation finally and it is preserved. Good silage, I submit to be one of the sweetest, most wholesome foods that a man can feed a cow, and my observation is that it greatly helps the condition of the cattle, their health, their thriftiness and the amount of milk they give. Why, I can make milk with ten pounds of alfalfa hay and thirty pounds of corn ensilage, the cheapest of anything I ever saw. It almost closes the circle, is almost a complete ration. All I have to do is to drop in as keystone up there in the top, about fifty per cent of the amount of grain that I usually have to feed, and I have closed up the circle, and my cows are at their maximum flow.

Mr. Marty: There has been considerable said about silage feed. There is no question in my belief that silage is a great feed for cows producing milk, it reduces the cost per cow; but why is it, if it is as claimed the milk from silage is absolutely

pure, sweet as grass feed, that we cannot use silage milk in the manufacture of Swiss cheese? That has been demonstrated right out here with heavy loss to an individual not nine miles from here, a man with thoroughbred Holstein cows. He had to switch over from the manufacture of cheese to the manufacture of butter, and if, as it is claimed, the casein is higher in Holstein milk, it seems to me very poor policy for a man to turn over in that way when the price of cheese is such as it is. He is a man who keeps records and he found out from actual experience.

Ex-Gov. Hoard: Did you have more than that one man's experience?

Mr. Marty: The best experiment that was carried out was by that one man, because the records were kept there. He is a graduate of the Agricultural School; he learned to feed silage and he was determined to carry that through, and he finally gave it up because he had a loss.

Ex-Gov. Hoard: There may be something in the making of Swiss cheese that interferes with silage milk. Does anybody know what it is?

Mr. Marty: No. I wish to say further that when I was going to the University Dairy School at Madison, we carried on experiments along that line, I worked for my own satisfaction. We took milk where we knew silage had been fed, and with the very worst results in every case. There is a fermentation there which will go on in that cheese. It is hard enough to bring about the right kind of fermentation. What we are after is a very slow fermentation, and it does not come for about two or two and a half weeks, and if something else gets ahead of it, that cheese is spoiled.

Mr. Everett: Before we close this subject, I want to cite an illustration on this feeding of ensilage to cows, the milk of which goes to the condenser. I presume that those of you who are conversant with the products manufactured at Horlick's malted milk factory at Racine know there is no finer product made in this world. There is no milk manufacturing concern in the world as large as that institution or making as much money. The barns and herds are inspected regularly by Dr.

Evans, and they are very particular about the cleanliness, the health of the cows, etc., but they allow their patrons to feed ensilage. That is pretty strong evidence to me that this matter of not feeding it to produce condensed milk is a sort of ghost in the closet.

THE POSSIBILITY OF INCREASING THE PRODUCTION OF OUR COMMON COWS BY GOOD FEED AND CARE.

Prof. D. H. Otis, Madison.

A man engaged in the dry goods, grocery, or manufacturing business always stops to consider the cost. He figures on paying a certain amount for rent, for stock, and for machinery. His success in the business will depend largely upon his location, the quality and quantity of the goods he handles, the efficiency of his machinery, and upon intelligent management. He must exercise executive ability in order to secure his raw material in the lowest market, consistent with quality, and purchase them at such points and in such quantities as to reduce the transportation charges to the lowest notch.

In a similar manner successful dairying must be considered as a business proposition. Money invested in the cow should bear a fair rate of interest. The cow is looked upon as an animated machine, which has for her purpose the conversion of feed into dairy products. We know that in the manufacturing world, machines vary greatly in their efficiency and the cow is no exception to the rule. The quality and especially the quantity of the foods the cow handles will have much to do with the size of the profits. The raw material (feed) for this cow machine must be procured in the cheapest market and at the lowest cost for transportation. This is usually found on the farm. The cow machine, like any other machine, will turn out the largest profit when taxed to its optimum, if not to its maximum capacity. In any machine a certain amount of energy is needed

to run it before any product can be turned out. With the cow this is estimated to be about 60 per cent of the energy contained in the food she can eat and this brings us to our first proposition.

THE COST OF KEEPING A COW.

During the year ending June 30, 1907, the average feed consumed per cow of the dairy herd of the Wisconsin Experiment Station was hay, 1,110 pounds; silage, 7,329 pounds; soiling crops, 1,148 pounds; bran, 545.2 pounds; oats, 464.4 pounds; corn, 259 pounds; oil meal, 81 pounds; molasses beet pulp, 180 pounds; gluten feed, 64.7 pounds; cotton seed meal, 38.3 pounds; distillers' grains, 382.3 pounds; brewers' grains, 29.8 pounds; total, 2,044.7 pounds.

The cost of this ration was $36.65. Investigations among creamery patrons in Wisconsin and New York showed the cost to be approximately $35.00. The average cost of feed for 1,062 cows in the Iowa Cow Census, 1906, as given by *Hoard's Dairyman,* was $28.23. A number of tests conducted at various experiment stations shows the cost of feed to range from $30.00 to $35.00 per cow.

In addition to the feed cost, other items must be considered. The Ohio Experiment Station has summed this up as follows:

Interest and taxes to apply on cow.....	$3.50
Depreciation in the value of cow.....	8.00
Interest and taxes on dairy buildings.....	3.50
Labor	12.00
Total	$27.00
Less value of manure.....	6.00
Net	$21.00

In these figures the cow is valued at $60.00 and it is estimated that her period of usefulness is six years and at the end of that time she will be worth at least $12.00 for the butcher. This leaves a depreciation of $8.00 per year. Putting these

various items of cost together we find that the cow must produce $50.00 to $55.00 worth of dairy products in order to pay for the cost of keep.

We should credit the cow with the value of the calf at birth. This may run all the way from $1.00 up to $50.00 or even more. We will assume that the average price is approximately $5.00. Assuming the feed cost to be $30.00, and other items of expenses $20.00, and the value of the calf $5.00, the cow must produce at least $45.00 worth of dairy products before we can expect her to turn out any profit. With 3 per cent milk and 20 cent butter fat, this would be 7,500 pounds of milk. With 4 per cent milk and 20 cent butter fat, 5,625 pounds of milk; with 3 per cent milk and 25 cent butter fat, 6,000 pounds of milk; with 4 per cent milk and 25 cent butter fat, 4,500 pounds of milk. If it were possible to reduce the cost of keep to $30.00, the amount of milk that she must produce to cover the cost of keep with 3 per cent milk and 20 cent butter fat, would be 5,000 pounds. With 4 per cent milk and 20 cent butter fat it would be 3,750 pounds. With 3 per cent milk and 25 cent butter fat, 4,000 pounds; with 4 per cent milk and 25 cent butter fat, 3,000 pounds. We assume that the skim milk will pay the cost of separating and hauling the cream or milk to market. These figures will give us an idea of how much a cow must produce before it will be possible to milk her and convert her products into butter or cheese.

Of course, the cost of keeping a cow varies in different localities and in different years in the same locality, but any farmer can take the above calculation and adapt it to his own conditions at any given time of calculation.

WHAT OUR COWS ARE PRODUCING.

Mr. C. B. Lane, of the Dairy Division of the United States Department of Agriculture, reports that the average cow in the United States is producing approximately 3,646 pounds of milk and 155 pounds of butter. In the last year book (1906) published by the United States Department of Agriculture, the

statement is made that a large percentage of the cows in the north central states are yielding only a trifle more than 100 pounds of butter per annum. The Illinois Station, from records of a large number of creamery patrons, which are probably above the average of the state, reports that the average cow among these patrons is producing 4,721 pounds of milk and 173 pounds of butter fat, equivalent to 202 pounds of butter. *Wallace's Farmer,* in discussing the subject of dairying in Iowa, estimates that one-third of the cows are eating their heads off, another third are barely paying for their feed, leaving only one-third producing dairy products at a profit and these, like Pharaoh's fat kine, are being consumed by the poor kine.

These average statements, while they are eye openers, do not begin to tell the whole story. It is indeed interesting to note the differences between net income and profits realized by various creamery patrons. These results are forcibly brought out in the following table:

Comparison of the herds of creamery patrons.

	Number of cows kept.	Milk produced per cow.	Butter per cow.	Returns from creamery per cow.	Cost of feed per cow.	Total income including calf and skim-milk.
Wisconsin: (100 herds.)		Lbs.	Lbs			
Best five herds	15-35	6,657	313	$58 32	$31 20	.....
Poorest five herds	12-40	3.472	161	30 27	24 80	.....
Difference	....	3,185	152	$28 05	$6 40	.....
Kansas: (82 herds.)						
Best five herds	3-20	5.476	253	$33 74	Ab't $20	$45 13
Poorest five herds	3-2.	1,644	74	9 44	" 15	23 59
Difference	.....	3,832	179	$24 30	Ab't $5	$21 54

A study of these figures for the Wisconsin herds shows the milk, butter and cash returns per cow are nearly twice as much for the best five herds as for the poorest five herds, while the cost of feed is less than a third more for the best cows. The investment of $6.40 in feed produced an increased income of $28.05 or 438 per cent interest on the investment. After de-

ducting the cost of feed the profits for the best five herds amount to $27.12 per cow and for the poorest five herds, $5.47 per cow. In other words, as far as dairy products are concerned, one cow from the best five herds is worth as much as five cows from the poorest five herds plus the saving in labor and stable room. Comparing the profits above cost of feed of the best herd with next to the poorest herd (the poorest herd was fed at a loss) we find there are $31.41 for the former and only $5.38 for the latter, making the products of one cow from the best herd worth nearly six cows from the other herd.

The differences with the Kansas herds are in some respects more striking. The average cow in the poorest five herds produced only 74 pounds of butter for the year. The figures show a difference of $5.00 in the feed bill as contrasted with $24.30, difference in profits above cost of feed. After crediting the cows with the value of the calf and skim milk, the best five herds brought an income of $45.13 per cow and the poorest five herds, $23.59 per cow, or a difference in favor of the best herds of $21.54 per cow. After deducting the cost of feed, the best five herds have a profit of $25.13 per cow and the poorest five herds, $8.59. In other words, one cow from the best five herds is worth as much to a man as three cows from the poorest five herds, including the value of the calf and skim milk. Comparing the best herd with the poorest herd, we find that one cow from the former is worth as much as eleven cows from the latter, including the value of the calf and skim milk.

If there is such a difference in the herds, how about the differences between individuals in the herds? The Illinois Experiment Station has collected some interesting and instructive figures along this line. They have found the best cow from the records they have obtained to produce 619.9 pounds of butter fat, equivalent to 723 pounds of butter, and the poorest cow produced 78.3 pounds of butter fat, equivalent to 91 pounds of butter. Of 478 yearly records of individual cows, comprised largely of common and grade stock, they found 59, or 12 per cent, that produced less than 150 pounds of butter fat; 203, or 43 per cent, that produced from 150 to 250 pounds; 158, or 33 per cent, that produced from 250 to 350 pounds; 43, or 9 per

cent, that produced 350 to 450 pounds, and 15, or 3 per cent, that produced over 450 pounds of butter fat per cow per annum.

To show what can be done with our common or native cows, two of our experiment stations, namely, Kansas and Michigan, have purchased herds representing approximately the average cows of their respective states. These cows were well cared for and fed liberally on well balanced rations, and all had an equal opportunity to show results. The record of the 28 Kansas cows is summarized in the following table:

Best and poorest cows compared.

KANSAS EXPERIMENT STATION.	PRODUCTS.		
	Milk.	Average test.	Butter test.
	Lbs.	Per cent.	Lbs.
Averages of the best five cows	8,255	4.24	350.1
Averages of the poorest five cows	3,043	3.92	119.5
Differences	5,212	.....	230.6
Best cow	9,116	4.21	383.7
Poorest cow	2,463	3.54	87.2
Differences	6,653	.....	296.5

The best five cows, which produced an average of 350 pounds of butter fat per head, show some encouraging possibilities even with common cows. That the poorest five cows, with equal opportunities, produced only 120 pounds of butter fat per head shows just as conclusively that there are some cows, in this instance over 25 per cent, that have not the capacity to convert feed into milk at a profit, no matter what the quantity or quality of the feed.

The Michigan Experiment Station purchased a herd of grade cows in 1904. A summary of the results obtained is shown as follows:

Best and poorest cows compared.

MICHIGAN.	PRODUCTS.		
	Milk.	Average test	Butter-fat.
	Lbs.	Per cent.	Lbs.
Average of best five cows	7,393	4.3	321.2
Average of p orest five cows	4,400	4.1	180.8
Difference	2,993		140.4
Best cow	7,607	4.8	368.1
Poorest cow	1,205	3.4	41.1
Difference	6,402		327.0

The difference in the annual production between the best five cows and the poorest five cows is marked, though not so great as with the Kansas herd. The difference between the best and poorest cow is greater than in the Kansas herd.

The retarding influence of one poor cow.

Cow.	PRODUCTS.		
	Milk.	Average tests.	Butter fat.
Kansas—	Lbs.	Per cent.	Lbs.
No. 20 (best cow)	9,116	4.21	383.7
No. 7 (next best)	6,966	4.8	334.5
Average.	3,041		359.1
No. 61 (poorest cow)	2,463	3.54	87.2
Average of the three	6,182		268 5
Average of the herd	6,288	3.99	251.2
Michigan—			
No. 17 (best cow)	7,607	4.84	371.1
No. 13 (next best)	88.113	4.45	331.7
Average	7,860		366.4
No. 16 (poorest cow)	1,205	3.43	41.1
Average of the three	5,642		258.0
Average of the herd	6,259	4.08	255.6

This table shows some remarkable results. With both the Kansas and Michigan herds the poorest cow when compared and averaged with the two best cows in the herd will lower the average of the three to the average of the entire herd. In other words, the one poor cow lowers the average production of the two best cows practically 100 pounds of butter fat per head. Is it any wonder that with many of our dairymen the profits are scarcely visible to the naked eye?

The figures of the different herds show the great variation that takes place between herds. The figures of the individuals in the herd show the great variation that takes place among individual cows of the herd. Together, they show the possibilities of greatly increasing the average annual income per cow. That the need of such work is imperative is shown by the fact that Wisconsin cows, 1,365,000 in number on January 1, 1907 (according to the last year book published by the Department of Agriculture), had a value of $31.00 per head.

In *Hoard's Dairyman* for August 25, 1905, we find the record of a herd of twenty-eight cows that ran its owner in debt for $127.00 for the year. Another herd of seven cows brought the owner a profit of $245.00 or $35.00 per cow. The latter herd not only showed the profit but required less labor and less feed.

Another contrast in cows and cow owners is recorded by Buff Jersey in a visit made to a dairy district near St. Louis. He found one herd of fifty-seven cows (cared for by four men) whose average daily production was four gallons of milk per head. On the same railroad, at the same time, there was being shipped to St. Louis the products of 250 cows which were cared for by twenty-two men, but the production of these 250 cows was less than one-half of the daily production of the 57 head mentioned. At the Kansas Station it was found with a test of common cows that it was possible to secure an average of 270 pounds of butter as the result of good feed and care. The average of the state at the same time is said to have been only about 72 pounds and the average of the eighty-two patrons in one of the best dairy districts of the state was only 123 pounds. In spite of these good returns from common cows, which only cost

$30.00 apiece, it was found that five of the best out of twenty-eight produced dairy products worth $28.89 above the cost of feed and that another five with equal opportunities produced $6.35 above the cost of feed, or a difference of $22.54 per cow, which figured in another way amounts to 455 per cent better income for the best five cows. With this herd it was found that 14 per cent were running the Station in debt for their feed, to say nothing about their care. Had this 14 per cent been eliminated from the herd at the start, it would have increased the average production of the herd 411 pounds of milk and 17 pounds of butter fat, or the income per cow would have been increased 23 per cent.

A study of the causes of these variations in herds and individual cows reveals some interesting facts. First, there is a difference in men. There are men milking cows today who have no business ability along dairy lines. No matter what kind of cows or what kind of feeds they have, they will not make a success of the dairy business. Second, there are cows which are being used for dairy purposes that never ought to be milked. Many of these cows cannot and will not convert feed into milk at a profit. They lack the dairy temperament.

On the other hand, there are many cows which, given the proper feed and care, would return their owners better, if not handsome, profits. A large majority of these belong to what we call common or grade cows. While it is desirable that dairy farmers get into pure bred cattle as rapidly as possible, it must be admitted that for a long time to come the common cows will be with us. At the present time we are absolutely dependent upon them as the production of the pure bred animals furnish only a small fraction of the dairy products demanded by our increasing population. The question which confronts us today along with the question of grading up our herds, is how to get the utmost out of these common or grade cows.

The best results must come through good care and feed. The dairy cow is a sensitive animal. With her thin coat of hair, her thin hide, and comparatively little fat beneath her skin to keep her warm, she feels the cold blasts of winter much more than the beef steer with his thick coat of hair, thick hide, and

an abundance of fat beneath the skin. Our dairy cow must be well sheltered. She must have plenty of fresh air and water from which the chill has been removed, which is as much a part of her food as the grain and hay.

Results with the grade herds at Michigan and Kansas, as well as reports from various papers of the country show conclusively that many of these common cows fail to yield their owners a large or as large a profit as they should because of the lack of sufficient food. A good dairy cow should be fed, first of all, liberally. Investigations carried on in Canada show that the herds which bring in from 5,000 to 6,000 or 8,000 pounds of milk per annum, contrasted with those that bring in from 2,000 to 2,300 pounds per cow per annum are fed generously, while the others are being fed barely enough or very little more than to keep them alive.

A few years ago Cornell University made a test to determine the effect of feed on increasing the per cent of butter fat. Among the herds visited, they found one man who was willing to let the representative of the Station stay at the farm and make records of the feed given and the dairy products produced. The results obtained showed that the cost of feed was $28.00 per head and the cows produced dairy products worth $24.50 per head, or a loss of $3.50 per cow. The owner, being confronted with these figures, was induced to sell the herd to the College. At the end of the second year each cow in the herd had produced dairy products worth $38.00 per head. The cost of feed amounted to $33.00 per head, leaving a profit of $5.00. It will be noticed that the increase of $5.00 in feed made a difference of $13.50 in favor of each cow.

Another experience illustrating the value not only of liberal feeding but of judicious feeding is given by Mr. J. H. Grisdale of Canada. He took a herd of twenty-five cows and fed them all they would consume for one year, with the result that the herd averaged 5,400 pounds of milk per head. The next year he weeded out two of the poorest animals and started in to feed not a more generous ration but a more suitable one, figured out according to our best knowledge along feeding lines. This year he realized 6,500 pounds of milk per cow or an increase

of 1,100 pounds for each animal in the herd. At the same time the cost of food was reduced $2.00 per head. This illustrates that it is possible to feed an animal liberally and yet not judiciously. Some cows will eat from 15 to 20 pounds of meal and give no better results than when fed 8 or 9. The writer had an experience in over-feeding cows on alfalfa hay at the Kansas Experiment Station. The boys doing the milking were competing with each other as to how much milk they would get from the cows, and in feeding them they kept increasing the amount of alfalfa hay until they were feeding 43 pounds of hay daily per cow. This amount was reduced to 33 pounds and later to less than 30 with no difference whatever in the yield. Ordinarily we can give a cow all the roughage she will eat, and with the possible exception of alfalfa and clover, there is no danger of her eating too much.

In order to realize the largest profits we must raise all the roughage and as much of the grain as possible on the farm. I assume that we realize what the cow needs in the way of digestible nutrients to produce the best results. The question which then confronts us is what feeds will give us the largest amount of nutrients per acre? Of all the nutrients needed by the cow, protein is by far the most important. Our carbohydrates and ether extract are supplied in the ordinary feeds grown on the farm, but the greatest concern to the dairyman, in order to properly balance his rations, is to get more protein. The value of some of our different crops from the protein standpoint is shown in the following table:

Yield of digestible protein.

Roughage.

Feed.	Yield per acre in tons.	Digestible Protein.	
		Per ton.	Per acre.
Timothy	1.5	56	84
Mixed hay	1.5	118	177
Corn silage	10.0	18	180
Red clover	2.0	136	272
Alfalfa	4.0	220	880

Grains.

Feed.	Yield per acre in tons.	Digestible Protein.	
		Per ton.	Per acre.
	Bushels.		
Corn	33	158	146
Barley	29	174	121
Oats	35	184	103
Soy beans	15	592	266
Bran		244	
Linseed meal		586	
Cottonseed meal		744	

From this table it will be noticed that timothy hay yields only 56 pounds of protein per ton and only 84 pounds per acre, the lowest of any of the feeds mentioned. Corn silage, which is considered more as a carbohydrate and succulent feed than a protein feed, yields only 18 pounds of digestible protein per ton, but on account of the larger yield shows more digestible protein per acre than mixed hay. Red clover yields nearly 100 pounds more digestible protein per acre than mixed hay or corn silage, which accounts for the high regard in which this roughage is held by progressive dairymen.

Alfalfa is a comparatively new crop for Wisconsin, but thanks to the persistent efforts of Governor Hoard, the farmers of this state are beginning to grow this valuable forage. It will be noticed that this crop yields 220 pounds per ton, or 880 pounds per acre of digestible protein, making it practically equal to bran pound for pound. Feeding experiments demonstrate that it can, in a large measure though not completely, take the place of grain in the ration of the dairy cow.

In comparing the grain feeds it will be noticed that corn is a carbonaceous feed, containing only 158 pounds of digestible protein per ton, while bran contains 244, linseed meal 586, cottonseed meal 744 and soy beans 592 pounds per ton. When the feeder is short on protein, it is well for him to consider if he cannot economically supply this lack by raising soy beans or purchasing some highly nitrogenous feed as linseed meal,

cottonseed meal, Ajax Flakes, etc. When the dairy farmer grows an abundance of nitrogenous roughage, like clover and alfalfa, he will need to buy very little of these high priced nitrogenous concentrates.

To make the most of our common cows, it is necessary, first of all, to weed out those cows that do not have the capacity or temperament to produce milk at a profit for feed consumed. This should be followed as soon as possible with the elimination of those that can produce only a small profit. The remainder should be fed first liberally and such feeds and combination of feeds that will enable the cow to produce the maximum yield with the least expenditure of energy and the least waste of feed nutrients.

Even though good results are obtained with common cows, every dairyman should realize that they are simply the means to an end. In other words, they are the crutches that enable us to live and move until we can get better stock. The herd of common dairy cows, no matter what their record, should be headed by a good pure bred dairy sire that will enable the dairyman not only to maintain but to materially increase the average production of his herd. No dairy farmer who has good judgment in the selection and improvement of his cows and in the growing of well balanced feeds for their use need be without a good sized check regularly every month that will make him happy, contented and prosperous.

DISCUSSION.

Ex-Gov. Hoard: I want to know if, in your judgment, you think the Wisconsin cows are 146 pounds of milk below the average of the United States?

Prof. Otis: No; in Wisconsin we have simply taken a total production and the total number of cows and tried to figure out the average production. In the case of Illinois cows they have taken simply that cow census and they themselves say that they have in some of the better herds in that state which is probably

considerably above the average; so I do not want any one to think that these are to be compared with each other. All I present these for, is to show that even though they take the best of them, and assume that Wisconsin runs even above the best, we still have a very low production per cow.

Mr. Luchsinger: You have used the word "protein" a good many times, and stated its value in feeding cattle. I wish you would make a short explanation of the particular part protein plays in the production of milk.

Prof. Otis: You analyze milk and you will find it contains in the neighborhood of four per cent casein. Casein is a nitrogenous ingredient. Now, the feed that goes to the animal must be of such character that will make that kind of product and it takes protein to produce it. It takes protein to produce lean meat. The cow is constantly called upon to turn out these protein products and she must be fed the material from which to produce it.

The Chairman: The protein in casein and the protein in feed are substantially the same product.

Prof. Otis: Similar, yes.

Mr. Luchsinger: If she does not get it in her feed, she either fails in the quantity of her product, or else it must be supplied in some other way and it wears on the constitution of the animal.

Prof. Otis: Yes, a dairy cow will continue to give milk for the calf even though she has to do it at the expense of her own body, and you feed a cow, for instance, on corn, and corn stubble, and you will supply her with sufficient protein to keep her system going and a little bit over, but in any machine we want to tax that machine to its capacity, and in order to do that we must supply more raw material. In other words, you must supply a cow with more protein in order to get her to do her best. It will take sixty per cent of what the cow eats to keep up her animal system. If you feed ten per cent more you will get ten per cent profit, if you feed twenty per cent over that you will get double profit. When farmers try to save on feed, they are doing the most extravagant thing they can do.

Ex-Gov. Hoard: Provided they have a good cow to put it in.

Mr. Luchsinger: Which do you call the better feed, soy beans fed as grain or as hay?

Prof. Otis: The composition of the hay is practically the same. Soy beans can be raised as a grain feed. I would not think it would pay to feed cow peas unless they are cracked grains or grains not fit for planting as seed. You can supply the amount of protein necessary easier from alfalfa or clover than from your soy beans. The soy beans may be used as an intermediate crop or a catch crop, when your supply of protein is short, or when your clover or alfalfa happens to kill out.

Prof. Henry: Some one spoke of buying cotton seed meal here at $30 a ton. That is an exceedingly low price for cotton seed meal, and the merchants of this town ought to have it on sale. The Illinois Central runs right down to the factories where the cotton seed is changed to oil and cotton seed meal. The Illinois Central ought to give a very reasonable rate on cotton seed meal to Monroe and the farmers ought to know about it and be able to feed it profitably, and the milk condenser ought to be interested in that. The farmers here ought to know that when it is low in price, it is very advantageous to use.

Ex-Gov. Hoard: When you compare the amount per pound you pay for your protein, just look at it. Supposing that you paid $20 a ton for corn and you got 158 pounds of protein in a ton, and you paid $30 a ton for cotton seed meal and you get 744 pounds of protein in a ton. Just see the difference. You can figure out what you are paying a pound for protein in corn and other kinds of feed and it is a great deal more. You come down to cotton seed meal and you are paying a little over four cents a pound for protein at $30 a ton for the meal.

Prof. Henry: You are at one of the points here where you ought to be able to get cotton seed meal cheap. Two years ago this spring I rode through eight miles in the tobacco country and I passed eight wagonloads of cotton seed meal going out in the country, and they were not feeding it to the cows either, they were spreading it on the tobacco fields. Now, if tobacco growers feel that they are justified in using that expensive article as they do manure, it shows that they must understand its great value.

THE PRESENT STATUS OF OLEOMARGARINE IN WISCONSIN.

J. Q. EMERY, Dairy and Food Commmissioner, Madison, Wis.

Section 4607c, Statutes of 1898, as amended by chapter 151, laws of 1901, provides that any person who "shall by himself, his agent or servant, render or manufacture, sell or solicit or accept orders for, ship, consign, offer or expose for sale, or have in possession with intent to sell any article, product or compound made wholly or partially out of any fat, oil or oleaginous substance or compound thereof, not produced from unadulterated milk or cream from the same, and without the admixture or addition of any fat foreign to said milk or cream, which shall be in imitation of yellow butter, produced from such milk or cream with or without coloring matter," shall be punished as therein prescribed. "Nothing in this section shall be construed to prohibit the manufacture or sale of oleomargarine in a separate and distinct form and in such manner as will advise the consumer of its real character and free from coloration or ingredient that causes it to look like butter."

This statute was first enacted in 1895. The amendment of 1901 simply made those who "solicit or accept orders for" the product amenable to the law. To the ordinary dealer, as well as to those who were interested in framing the bill and securing its passage, its meaning seems plain and unambiguous; but a law in this state, as well as in every state, is not necessarily what the framer of the law intended it to be, but means just what the supreme court, or the court of highest appeal, says it means. It has been interpreted by the dairy and food commissioner to mean that the sale of oleomargarine which in its color could be taken for yellow butter is prohibited. It seems to have served the purpose of manufacturers of oleomargarine to challenge this view of the meaning of the statute.

It does not come within the scope of the subject assigned me to speak of the struggles of the dairy and food commission in the enforcement of that law.

A decision of the supreme court was handed down on January 8 in a case involving the interpretation of the law we are considering. The case was brought against Nowack and Meyer of Watertown for selling a compound, described in the terms of the statute and as in imitation of yellow butter. As the penalty exceeds $100, such cases cannot be tried before a justice of the peace, but must be brought in the circuit court. The defendants were examined in justice court and were held for trial in the circuit court of Jefferson county, before Judge Grimm. The case was tried in February, 1907. The defendants were found guilty and fined $50 and costs. An appeal was taken to the supreme court and the decision of that court was rendered January 8. The complaint in the case was drawn by L. E. Gettle of Edgerton. The case was conducted by Mr. Gettle and the district attorney for Jefferson county until it reached the circuit court. John M. Olin of Madison was then brought into the case as counsel for the state. He was aided by Mr. Gettle and the district attorney.

The limitations of time preclude any detailed description of the trial of that case in the circuit court for Jefferson county; but to understand the present status of oleomargarine in Wisconsin a knowledge of some features of that trial is absolutely necessary.

The professed theory of the oleomargarine manufacturers and of their legal representatives was that the law must be so construed that if oleomargarine contained no artificial coloring its sale was not in violation of the law, however yellow it might be. One of the witnesses, acknowledged to be the manager of the oleomargarine department of one of the Chicago oleomargarine manufacturers, was reckless enough to swear, in another case brought before Judge Clemenson, that oleomargarine of necessity varied in color with the change of seasons, just as the natural color of butter changes with the change of seasons, and also that if the law were construed to prohibit the sale of oleomargarine of the color of yellow butter, the law thus construed would be prohibitive of the manufacture of oleomargarine during some seasons of the year. It would be both interesting and astonishing to consider some other phases of the testimony of

that witness in that trial; but the limitations of this paper do not permit.

Being forewarned by such remarkable testimony, the dairy and food commission, in the case of the State vs. Nowack and Meyer, made investigations as to how the yellow color in the oleomargarine is produced. We purchased tallow from different butchers from grass-fed animals and from grain-fed animals as well. We manufactured oleo oils from the samples of the beef tallow we had purchased, and neutral lard from the leaf lard purchased. We were enabled to procure from a reliable source samples of different kinds of oleo oils ranging in color from white to a golden yellow; three distinct different grades in all in relation to color. Practically white oleo oil is manufactured from the best grades of grain-fed beef cattle, and is the best quality of oleo oil. Dark yellow oleo oil is manufactured from old cows, grass-fed cattle, etc., and in quality is the poorest grade of oil. There are intermediate grades of oleo oil based upon color between these two.

Since the enactment of the oleomargarine law of 1902, it has been a favorite course of procedure for the oleomargarine manufacturers to endeavor to convince the public, courts and juries, that the yellow oleomargarine which was manufactured without the use of artificial coloring is of necessity yellow. We were able to overthrow this contention in the trial of the case herein referred to. Dr. Richard Fischer, chemist for the dairy and food commission, commonly known as the state chemist, was able to establish the fact that the oleomargarine in question was produced by the use of about 65 per cent of very yellow oleo oil, 20 per cent of neutral lard which is practically white, and 15 per cent of cotton-seed oil. He was able to establish by his testimony that the yellow color of the oleomargarine in question, which was in resemblance to yellow butter, was secured through the selection of the darkest shades of yellow oleo oil, of which a very high percentage was used.

In its decision, the supreme court of Wisconsin holds that the sale of oleomargarine "which shall be in imitation of yellow butter" is prohibited by the statute. It holds that the words "yellow butter" require no definition to explain their meaning;

that they define themselves and are used in the statute in the popular, rather than in any trade or technical, sense. It holds that whether the prohibited product is in imitation of yellow butter is a question of fact to be determined by the jury and that the article is to be compared with yellow butter by direct testimony of any person who is able to testify on the subject, which will include all ordinary witnesses except those who show affirmatively their lack of knowledge or some degree of color-blindness.

The court says that the question whether the article sold by the defendants was the identical thing which is contraband by the statute must be determined by the testimony of witnesses who have seen it, or by the testimony of witnesses aided by the inspection of the article itself, and that its resemblance to yellow butter is a factor in such determination. If the article is in imitation of yellow butter, it matters not whether such imitation is brought about by the addition of a dye or by the selection of ingredients. The court declares that there is no distinction so far as producing color is concerned between imitating or producing color by the addition of an ingredient known as a dye and added for the purpose alone of producing a given color, and the selection and addition of an ingredient which performs the same coloring function, but at the same time adds other qualities to the compound.

The court holds that the words "which shall be in imitation of" used in describing the contraband compound, imply a conscious imitation in the manufacture thereof. The court explains the meaning of conscious imitation as follows: "If one forming a compound of several ingredients knowingly select and use an ingredient which imparts to the compound the color of yellow butter, he having choice of ingredients, he will have made his compound in imitation of yellow butter just as well as if he selected a dye." "There is, however, this difference, viz., proof of the presence of the dye, which can have no other function than that of producing color, showing the conscious imitation quite clearly, while proof of the selection of the ingredients which produced the color of yellow butter, the person selecting having the choice of ingredients, is a fact from which the jury

is authorized to infer a conscious imitation notwithstanding such ingredient so selected has other qualities or is in one of its forms or in one of its colors a necessary ingredient of oleomargarine. Whether or not the article in question is in imitation of yellow butter cannot be determined alone by its resemblance to yellow butter, but resemblance aided by the evidence of the existence of a dye as one of its ingredients, or resemblance aided by evidence of the existence of available necessary ingredients which will not impart to the compound the color of yellow butter and of the existence of other available ingredients which will impart to the compound the color of yellow butter, may be considered by the jury as establishing or tending to establish conscious imitation by the selection of ingredients. What is yellow butter and whether the article in question is in imitation of yellow butter are questions of fact."

The supreme court expressed the opinion that there was evidence before the trial court from which the jury was authorized to infer conscious imitation in the manufacture of the compound as described in its decision and because there was evidence tending to show that the accused had knowledge that the compound in which they were dealing was not butter but oleomargarine and that it resembled yellow butter.

The court further says: "Resemblance to yellow butter, together with knowledge that the compound is not butter, with proof of the fact of selling, shipping, etc., will constitute a prima facie case." But, says the court, it will be necessary to cover by the proof both branches of the inquiry as set forth in the decision.

From this it plainly follows that where oleomargarine is being sold in resemblance to yellow butter, a prima facie case exists and renders the seller of such a product amenable to prosecution. In the trial, the state must establish by proof that the compound was in imitation of yellow butter and that that imitation consisted of resemblance to yellow butter aided by the presence of a dye or by the selection of material, other material being available. In this connection, let me repeat that the court expressed its judgment that such proof was before the trial court in the case, State vs. Nowack and Meyer.

The contention of the oleomargarine people has been that unless the compound contained an artificial color, described by the court as "a dye," there was no conscious imitation, but our supreme court holds that the selection of material is just as much a conscious imitation as the use of artifical color. And let me repeat again that the court held that there was evidence before the trial court warranting the jury to infer a conscious imitation; that is to say, we offered evidence warranting the jury to infer the selection of material. The offering of this evidence was strenuously objected to by the oleomargarine people and an exception was made, but the supreme court overruled their contention and held that the evidence was properly admitted.

The Dairy Food Commission has contended that imitation as used in the statute did not imply conscious imitation, but that its meaning was substantially the same as though the law had prohibited the sale of oleomargarine "which shall be of the color of yellow butter," or "which shall be in semblance or resemblance of yellow butter." While the state in that case held that the word "imitation," as used in the statute, did not imply conscious imitation, it furnished the same proof as though it had conceded that the imitation means conscious imitation as described by the supreme court. Most of the contentions of the state in the Nowack and Meyer case were sustained by the supreme court.

The statute as interpreted by the supreme court places the burden of proof on the state to furnish evidence of the presence of a dye or that there has been selection of material. If instead of the words "which shall be in imitation of yellow butter," the statute read "which shall be of the color of yellow butter," or "which shall be in resemblance or semblance of yellow butter," the interpretation of the statute by the supreme court remaining otherwise the same, the furnishing of such proof would not seem to be required.

Because of certain irrelevant testimony that was admitted despite objection and because of one instruction of the trial judge to the jury, held to be error, to the effect that the lightest shades of natural butter as well as the darkest shades of colored

or uncolored yellow butter and all intermediate shades were protected by the statute, the case was remanded for a new trial. The attorney for the oleomargarine people has informed me that the defendants in the case will, before or at the next term of the circuit court for Jefferson county, appear and "confess that they did it and pay their fine." That is to be the ending of the Nowack and Meyer case, according to the statement of their attorney.

Reports of dairy and food inspectors from all parts of the state indicate that since the decision of the supreme court the law, as interpreted by that court, is being very generally complied with. Violations have been found, but the number is comparatively small. They report as a general rule that the local dealers manifest a law-abiding spirit; that they express themselves as desiring to handle only the lawful product. Cases are reported where the local dealers have returned the yellow oleomargarine to the shippers. Not a few dealers have been so much annoyed by the questionable character of the goods shipped them that they have quit the business. The manifest determination of local dealers to be law-abiding is a recognized aid in the administration of the law. The attitude of the oleomargarine manufacturers, as expressed to me by their attorneys, has been that when they could know what the law is by an interpretation of the supreme court, they would comply with the law as thus interpreted. It is gratifying to state that the manufacturers of oleomargarine who have most perfectly met the requirements of the statute in the oleomargarine furnished the Wisconsin market have the great bulk of the trade at the present time.

DISCUSSION.

Secy. Burchard: I regret that Prof. Emery did not say that when this decision of the supreme court was announced all the leading daily papers of the state came out in quite flaming headlines, saying that the oleo law of Wisconsin had been annulled

practically, and thereupon a good many people chuckled, a little hastily. A more careful reading of the decision of the court satisfied Prof. Emery and myself even before we had made a study of it, that that was not the case, that in fact the dairy and food commissioner had won a very decided victory for the law and for the dairymen of the state.

Prof. Emery: The newspaper reporters in sending out that first report stopped short at a certain point where they said it must be in resemblance to yellow butter aided by the presence of a dye, and the whole pith of the decision was left out. The attorney for Swift & Company, who was in my office only a few days ago, said that the first part of the decision was very satisfactory to him. "If they had only stopped where I wanted them to, I would be satisfied with that decision, but they didn't." But the newspapers stopped just where the lawyer would have been glad to have the court stop, in making their reports. Now, I have had representatives of three of the largest manufacturing firms of Chicago in my office in the past ten days, and each of these has assured me—I am only giving you their word for it, gentlemen, but I have their word for it—that they propose to send into Wisconsin only such product as will pass inspection and meet the requirements of this Wisconsin statute. That they are doing that now is practically true; there are a few exceptional cases.

Mr. Everett: Keep your eye on them.

Prof. Emery: Yes, we will. Gentlemen, when a lawyer representing a great firm having millions of capital back of it will come into an office and tell a public officer charged with the enforcement of law, that these corporations are in business to make money, they are there to sell their products, we certainly will have to keep our eye on them. More than that, they have said to me that they will sell it unless the law is so enforced that the fines imposed will make it to their disadvantage to sell it under those circumstances. I knew their position before, but I did not expect lawyers would admit it. I tell you that the people of the state of Wisconsin and of this country have got to understand in the matter of food products that they have something to do to defend themselves against these pirates that are

upon them. The farmer that is producing pure wholesome food and wants a market for it has to contend with those people who are producing fraudulent imitations, because of the great wealth that those manufacturers can control in putting sellers and lawyers out in the country. For nearly six years I have been engaged in this work and I want to tell you that I believe that if the people of this state, this country, knew only one-half of what is true in this respect, they would rise in their might. But they are asleep, they don't understand it. The people of this country have something to do to protect themselves in their own rights, not to be robbed by people who are putting upon the markets spurious imitations and fraudulent foods.

Ex-Gov. Hoard: I can't say anything that will pound this into you any harder than Prof. Emery has. He is a man deadly in earnest, he is a good deal like a loaded gun, you don't want him to turn around the wrong way or you may get shot. I would like to have every farmer, when somebody throws out the usual sneer "I would rather eat oleomargarine than ordinary butter," or something of the kind, I would like to have him say one thing to this man that puts up that argument, and that is this, butter always advertises itself. Butter never acts under false pretenses. If there is anything the matter with butter, it tells it to the people, doesn't it? Can't you tell in a minute when it has lost its flavor? Not so with oleomargarine. You can juggle your oleo, you can flavor it, you can fool with it, you can blind the consumer with it, you can adulterate it tremendously, and you have no way of detecting it, except by the chemist. In the oleo fight in Washington, we found oleomargarine with eleven per cent paraffine.

You come to put the food of this country into the hands of interested capital, and where are you? Go right back to the farm. The farm is the only proper source of food in this country. The farm is the source of food and clothing, but in between the farmer and the consumer, stand a whole lot of these interested dishonest men who propose to juggle and sophisticate, and we need a great, big, strong, absolute public opinion to work against them. The farmer needs to stand up and understand what he is about; he needs to read and be posted. Just as likely as not

he will listen to some demagogue who may come along, and because he can raise a hue and cry against the man that is enforcing the law, he will vote in some unworthy man and let the good man out of office.

We have had a good administration of the Dairy and Food Commission; we have had a man striving against that combination in Chicago of $150,000,000 capital to down that agent who is trying to enforce the laws, to put in place of this genuine article of food, a fraud and a counterfeit, and a humbug.

During the last campaign, men were attacking the Dairy and Food Commission, trying to humbug the farmers into voting against the prosecution of this question, because, forsooth, it costs $30,000 a year. Great gods, what does that mean to a state with a dairy interest of $60,000,000? Men will talk this stuff, as though we should not stand up and support these institutions. I went through an awful hard fight, my dear friends, to get this Dairy and Food Commission established, and I helped draw the bill when I was occupying an official position in Madison, and I know that there were men at that time holding high positions in both parties under pay from Phil Armour in Chicago. One man confessed to getting $5,000 a year from Phil Armour to help overturn the dairy interests here in Wisconsin.

Prof. Henry: And where did Phil Armour get his $5,000 to pay him? From the Wisconsin farmer, wasn't it?

Ex-Gov. Hoard: Yes, sir. Now, I tell you, my good friends, we need to stand up and advocate the purity of our farm products the same as we would advocate the purity of our wives and our mothers. The purity of our farm products are in exactly the same relation to us, and when the farmer himself forgets that great law, in Green county or any other county, becomes dirty and slovenly, takes his milk to the creamery or the cheese factory or to the condenser, and it is uncleanly, that man is playing right into the hands of the fraud and the counterfeiter and destroying the value of the product in the hands of the consumer. The farmer wants to look on this question in a broad way and when Prof. Emery goes after him for being dirty and slovenly, they mustn't think that Prof. Emery is their

enemy. It is a good deal like it is with our child, once in a while we have to take him across our knee and tell Johnny he needs a little spanking and Johnny gets mad and says that father or mother is his deadly enemy,—and they are not, you know. Johnny simply needs a spanking.

The Chairman: A little over a year ago the Wisconsin Dairymen's Association conceived the idea of doing a little missionary work through the establishment of cow testing associations throughout the several sections of the state where they had any encouragement. It was done for the purpose of building up better knowledge and a keener appreciation of the conditions found in average herds throughout Wisconsin. It was done to give wisdom to the dairyman with reference to his own conditions in his own herd, and plans were formed by which different herds were tested at a nominal cost per cow, records kept, and a system of bookkeeping, as it were, that would show to a greater or less degree the profit or loss made on the cows that were kept for dairy purposes in those herds that were tested. Mr. Searles has had charge of that work and I am glad to say that fifteen cow testing associations have been established. I believe he has been doing good work and that it is a thing to be very highly commended by this Association, one worthy of the patronage of every cow keeper in the state of Wisconsin. That subject will come up this afternoon and I am sure we will all be much interested.

Recess till 1:30 P. M., March 12, 1908.

Convention met at 1:30 P. M., same day.
President Gillett in the chair.

A LOCAL COW CENSUS.

FRED MARTY, Madison, Wis.

Some time ago I was informed by our secretary, Mr. Burchard, that I was to take up a "cow census" in Green county of a certain number of dairy herds and report the result at this convention. The purpose of the "cow census" or an investigation among our patrons of Swiss, Brick and Limburger cheese factories and general dairying of Green county was to compare the results with similar "cow census" and investigations of dairying in other parts of the state taken some years ago, and as dairying in this section of the state has always been considered in a class by itself and differs so much from the general dairying of other parts of the state, it therefore no doubt will be of interest to the dairymen who are here with us from other parts of the state to learn what the Green county dairymen are doing and compare results with that of your fellow dairymen.

The difference in dairying in Green county, and especially in this southwestern section of the state where the Swiss, Brick and Limburger are manufactured and dairying in other parts of the state consists chiefly in that the period of lactation in the herd here begins in the spring, say during the months of March and April, and lasts until the latter part of December. While in other parts of the state the cows are coming in at all times of the year, and in many cases it is practiced to have the whole herd fresh in the fall of the year and milked during the winter, and when spring comes they are turned out on a pasture. The dairyman in this case claims that the cows will earn him more per year than the cow that is fresh in the spring of the year. In the former case the cow as a rule is worked longer, and during the winter months the cost of feed is higher as more concentrated feed is fed, which is absolutely necessary to keep the cow in good condition during the winter.

While the cows in this section and surrounding counties are fresh in the spring of the year, and when the flow of milk is

highest, nature has provided sufficient feed for them to run on and satisfy their own wants; everyone helps himself, and no doubt the amount of feed that every cow should have in order to do her best is measured out in more equal shares than when she is in stanchion and at the mercy and judgment of her master. And when the winter months come she is at rest, as our dairymen term it, and is very easily kept in good condition on coarse forage, such as we have here, good timothy, clover hay, mixed with some shredded fodder, and after freshening, a little grain.

The investigation of this winter was carried on in Green county amongst some of the best dairymen and best cheese factory companies, also by some dairymen who had contracted their milk for the season, so you will see that I have not only selected the best dairymen for this report but have taken as near as possible an average of existing conditions. From this report you will see that we have dairymen who are up to date in their management and in selecting a dairy herd, and men who are away behind time, and as a rule I was greeted accordingly; the one who made his cows net him a nice income would supply me with all the information wanted and in many cases it was hard to break away, while the one who hardly netted enough per cow to pay for cost of feed would size me up for some schemer and thought his information too valuable to give away.

Upon my investigation I would call on the proprietor and from him I would ascertain the number of cows he kept; look over his barn, note the breeding and type of cattle, find out the kind and amount of feed the cows had, which in many cases was a very difficult proposition, as no account whatever was kept. But many of them gave me a pretty fair idea of the amount of grain their cows had. The coarse forage was easily ascertained by every one of them, and as many of them fed no grain at all, it made it so much easier. Those that fed grain could tell by measure, kind, and how long it was fed; some could tell by number of bushels they had ground, and also bought by ton, which I charged with running market price. Mixed hay, timothy and clover at $8.50 per ton, corn fodder at $2.50 per ton, pasture at $6.00 a head, a uniform price was charged for pasture, and all other kind of feed for each herd.

I have given all these facts in tabular form, giving the patron's number, number of cows, kind of cows, cost of feed per cow, returns from factory per cow, pounds of milk per cow, average price of milk per 100 pounds. Value of cheese for one dollar's worth of feed and net profit or loss per cow over cost of feed.

From the above you will see that the calves have not been credited to the earning of the cow, which no doubt duly belongs to the credit of the cow, but in order that this request will compare with former cow censuses, and as the calves have not been credited, I have also left it out, but have kept an account of what was received for calves, and found that prices ranged on an average per cow in the different herds from $5.50, $6.00, $7.00, $20.00 and $50.00 per cow, the latter being two full blooded herds. As this table will be published, I therefore will not take the time to give the whole of it, but will make some selections of it, which will serve to illustrate the most important points.

COWS FED NO GRAIN.

No. 2 had 21 cows, Holstein grades, some common red cows, and some Brown Swiss, good dairy type, fresh in March and April. Feed was mixed hay, timothy and clover, corn fodder, 80 shocks of poor corn with shocks in the fall worth $17.34, pasture $6.00, making a total cost of feed per cow $23.34. Return from factory $59.86, net profit per cow $36.52, pounds of milk per cow 4,267, average price of milk per hundred, $1.40. One dollar's worth of feed brought $2.56.

No. 3 had 35 cows, Holstein grades, good dairy type, fresh in March and April. Feed was timothy and clover hay mixed, shredded corn fodder, 40 shocks of light corn, worth $15.85, pasture $6.00, making a total cost of feed per cow, $21.85. Returns from factory, $51.78, net profit per cow $29.93, pounds of milk per cow 4,184, average price of milk per 100 pounds $1.25. One dollar's worth of feed brought $2.37.

COWS FED GRAIN LIBERALLY.

No. 4 had 50 cows, Holsteins, one full blooded, balance grade; good dairy type; fresh September, October and November. Feed was alfalfa and timothy hay worth $12.75, ground corn 9 pounds a day in winter worth $14.30, and pasture $6.00, making a total cost for feed per cow, $35.55. Return from factory $91.49; net profit per cow, $55.94; pounds of milk per cow, 7,383; average price of milk per hundred pounds, $1.22. One dollar's worth of feed brought $2.57.

No. 5 had 90 cows, Brown Swiss, 6 full blood, balance grade; fresh February to May. Feed, timothy and clover hay, corn fodder worth $12.75, whole corn and wheat meal worth $10.36, pasture $6.00, making a total cost of feed per cow $29.11. Return from factory $71.90; net profit per cow $42.79; pounds of milk per cow, 6,168. Average price of milk per 100 pounds, $1.16. One dollar's worth of feed brought $2.47.

These are both patrons of the same factory, and certainly a good showing. In this case it would seem as if No. 4, who had his cows fresh in the fall, had the advantage of No. 5, whose cows are fresh in the spring. This seems very reasonable, as the average price for winter milk ranges on the average 40 cents a hundred higher than that of the summer months, making in some months, when the highest price is paid in winter and the lowest in summer, a difference of 65 cents per hundred.

SMALLEST AND LARGEST RETURNS PER COW.

I will now compare the patron who received the smallest returns per cow with the one that received the largest returns. No. 15 had 8 cows, mixed breed, rather poor dairy type, fresh, March and April. Feed, timothy and clover hay mixed, corn and fodder, worth $12.75, ground grain, corn, barley and oats worth $6.04, pasture $6.00, making a total cost per cow for feed, $24.79. Return from cheese factory, $31.12; net profit per cow, $6.33; pounds of milk per cow, 3,193; average price of milk per 100 pounds, $.975. One dollar's worth of feed brought $1.25.

No. 8 had 35 cows, full blood Holstein-Friesians, fresh March and April. Feed, timothy and clover hay, shredded fodder worth $12.75, bran and corn worth $10.55, pasture, $6.00, making a total cost per cow of $29.30. Returns from cheese factory per cow, $100.57; net profit per cow, $71.27; pounds of milk per cow, 7,857; average price of milk per 100 pounds, $1.28. One dollar's worth of feed brought $3.43.

You have noticed that the difference in price per 100 pounds of milk between No. 15 and No. 8 was 30.5 cents, which, with other conditions, makes a difference in the returns from the factory of $69.45, and a difference in the net profit per cow of $64.94 in favor of herd No. 8.

Facts learned by the Green county cow census investigation—the dairy herds of 40 patrons from various Swiss, Brick and Limburger cheese factories, for the year ending December 31, 1907:

Cow Census of Green County.

Patron's number.	Number of cow.	Cost of feed per cow.	Return from factory per cow.	Pounds of milk per cow.	Average price of milk per 100 lbs., cts.	For one dollar's worth of feed.	Net profit or loss per cow over cost of feed.	Kinds of Cows.
1	29	$23 36	$59 76	4,808	$1 24	$2 56	$36 40	Holstein grades, fresh March, April.
2	21	23 34	59 86	4,237	1 40	2 56	36 52	Mixed breed, good dairy type. March, April.
3	35	21 85	51 73	4,148	1 25	2 37	29 98	Holstein grades, good dairy type. March, April.
4	50	35 55	91 49	7,383	1 22	2 57	55 94	Holstein, one full blood, balance grades. Sept., Oct., Nov. Good dairy typ s.
5	65	29 11	71 90	6,168	1 16	2 47	42 79	Brown Swiss, 6 full blood, balance grades, fresh February to May.
6	40	26 56	67 00	5,327	1 25	2 52	40 47	Holstein grades, "high grades," good dairy cows, fresh March, April.
7	32	26 75	71 87	5,187	1 38	2 67.6	45 12	Holstein grades. (Mch., April, fresh.)
8	35	29 30	100 57	7,857	1 28	3 43	71 27	Full blood Holstein Friesian, fresh February, March, April.
9	53	28 05	47 81	3,703	1 29	1 63	19 76	Ayrshires, 44 full blood, balance grades, fresh Feb., March.
10	30	27 24	46 36	4,804	96.5	1 70	19 15	Shorthorn and Swiss grades, fresh March, April.
11	24	23 31	59 01	4,766	1 23.8	2 53	35 70	Common red cows, fresh March, April.
12	21	23 87	49 83	5,045	97.3	2 09	25 96	2 Holstein grades, Shorthorn, good dairy types, fresh April, May.
13	13	21 17	50 12	5,084	98.4	2 36	28 95	Shorthorns (2 full blood Ayrshires), 1 half blood. Ayrshires fresh March, April
14	17	21 25	38 62	3,977	97.0	1 80	17 37	Holstein grades, red cows, fresh March, April.

Cow Census of Green County—Continued.

Patron's number.	Number of cow.	Cost of feed per cow.	Return from factory per cow.	Pounds of milk per cow	Average price of milk per 100 lbs., cts.	For one dollar's worth of feed.	Net profit or loss per cow over cost of feed.	Kinds of Cows.
15	8	24 79	31 12	3,193	$97.5	31 25	$6 33	Mixed herd, poor dairy types, fresh March, April
16	15	25 37	40 64	4,177	97.2	1 60	15 27	Shorthorn, some Holstein mixed breed, fresh March, April.
17	16	25 37	33 86	3,516	96.3	1 33	8 49	Mixed herd, poor dairy type, fresh March, April.
18	15	25 37	48 48	5,033	96.3	1 91	23 11	Grade Holstein common red cows, fresh March, April
19	13	25 37	49 70	5,152	96.4	1 95	24 33	Common red cows, some Holstein grades, fresh March.
20	43	29 43	41 95	4,2 4	99.83	1 42	12 54	Holstein high grades, fresh March, April, June.
21	16	21 25	46 78	4,662	1 00	2 20	25 53	Holstein grades, fresh April, May.
22	25	26 00	53 80	4,173	1 29	2 06	27 80	Holstein grades, fresh March, April.
23	25	26 80	70 64	5,474	1 29	2 63	43 84	Holstein grades, fresh March, April, July.
24	28	23 25	60 14	4,864	1 23.6	2 58	36 89	Mostly Holsteins, fresh March, April.
25	23	23 25	64 21	5,139	1 25	2 76	40 96	Common mixed herd, fresh March, April.
26	18	22 75	56 97	4,758	1 19.7	2 50	34 12	Holstein grades, fresh March, April.
27	20	24 75	61 00	4,963	1 23	2 46	36 25	Common dairy types, fresh March, April.
28	26	23 25	59 65	4,604	1 29	2 56	36 40	Holstein grades, fresh March, April.
29	28	24 25	56 28	4,363	1 28	2 32	32 03	Holstein grades, fresh March, April.
30	28	24 00	47 50	3,933	1 20.7	1 97	23 50	Durham grades, fresh March, April.
31	37	25 25	58 62	4.4 9	1 32	2 32	33 37	Durham grades, some Holstein grades, fresh April, May, June.
32	28	$24 00	$38 22	5,299	1 28	2 84	44 22	Holstein grades, fresh March, April.
33	22	30 00	64 13	4,937	1 29.8	2 13	34 13	Durham, Holstein mixed, fresh March, April.
34	15	24 00	40 00	3,202	1 24.9	1 66	16 00	Holstein grades, fresh March, April.
35	5	23 00	69 97	5,687	1 23	3 04	46 97	Mixed herd, fresh in spring.
36	25	24 00	63 52	5,102	1 24.4	2 64	39 52	Mixed herd, good dairy types, fresh in spring.
37	18	24 00	50 53	4,063	1 24	2 10	26 53	Common herd, fresh in spring.
38	44	24 00	49 27	3,957	1 24.6	2 05	25 27	Holstein grades, fresh in spring.
39	50	24 00	46 76	3,771	1 24	1 94.8	22 76	Holstein grades, fresh in spring.
40	64	24 00	54 70	6,253	87 4	2 27	30 70	Holstein, 30 full-blooded, balance grades, fresh March to May.

Some Averages.

	Green Co., 1907.	Waukesha Co, 1905.	Difference.
Total number cows kept by the 40 patrons.....	1,145	556	589
Average number cows per herd.....	29	14	15
Average cost of keep per cow.....	$25 05	$30 00	$4 95
Average earnings per cow.....	56 35	41 29	15 07
Net profit per cow.....	31 30	11 29	20 01

DISCUSSION.

Prof. Emery: On what do you base your $6.00 for pasture for the season?

Mr. Marty: That is the same basis taken by the census in Waukesha county. I hardly think it is enough; I think $10 would not be too much, but in order to make the two reports comparable, I put it at that.

Mr. Goodrich: In Waukesha county they have the skim milk left on the farm.

Mr. Marty: In Green county they have the whey left.

Mr. Goodrich: What is the difference in the value of whey and skim milk?

Mr. Marty: It is a hard thing to state, it depends so much upon conditions. I have worked upon a farm where the skim milk was delivered from the creamery to the farm and it was my chore to feed the hogs, and when it came to feeding time for the calves and hogs, I have had to take a stick and work the skim milk out of the can into the trough. We have whey that never gets into that condition, but on the average I must say that we have poor whey that has developed too much lactic acid; for the feeding value, it would be hardly anything. The milk sugar that it originally contains, I should say is destroyed.

Mr. Chadwick: Perhaps the whey in Green county is worth more than the skim milk in Jefferson county.

Mr. Marty: You see we have one man here that makes $100 per cow, and we have the books and everything to prove it, and we have some only $31 per cow, three or four averaged between $31 and $35.

Mr. Goodrich: In Waukesha county I took the census of all the patrons that patronize one particular creamery so they had all taken their milk to the same market, and I think that would make a little better comparison.

Mr. Marty: I couldn't have done that here, Mr. Goodrich. If I went to any other factory in the county outside of company factories, my average would have been higher. Those who, for the last ten years, have worked up their own milk were way ahead of those that sold their milk; anybody will admit that,

They have had the benefit of the booming cheese market for the last year, while those that contracted their milk did not get the full benefit of it, so I have taken ten patrons out of forty with the contracted price, so you will see I have not made an effort to get only the best patrons, but I believe I have an average of the existing conditions.

Mr. Goodrich: I took a cow census in Fond du Lac county a few years ago, and I couldn't use the best dairymen, because they did not patronize a creamery. For instance, Mr. Gillett and Mr. Hill and Mr. Scribner, if I could have put them in, just think where my average would have gone to, but I had to take their neighbors who had some good cows but did not care for them and did not feed them so well.

Mr. Marty: There are fifteen patrons in that factory, but I have only taken two so as not to pick out the best. I have been to the extreme northern boundary of the county and also way south of Monroe near to the state line, picked them out from different parts of the county.

Mr. Chadwick: In your judgment, if you had all the cows in Green county, would you average up higher or lower than the average you have here?

Mr. Marty: That would be a very hard question to answer, but taken from these facts that the majority of farmers of Green county have worked up their milk for the season and the percentage is so much larger than those that have sold their milk, I would take it for granted that the average would be higher.

Mr. Goodrich: Now, to get the most value out of this to the people of this community, they ought to know what those numbers refer to. I took a cow census down in the state of Indiana, I selected out some of the best and some of the poorest, and I had a table printed with the numbers, and you know they besieged me on all hands to find out what those numbers represented. A man would say, "This is mine, isn't it?" "Can't you pick it out," I says, and invariably they picked out somebody that had a big record, where the number of cows was the same; no man picked out the poorest one. I was very much amused at it, but I insisted I would not give it out until after the meeting, and then I would give it out to the whole meeting;

that is, I would let each one know that called on me how his cows stood; I did that, and I tell you there were some men there that were awfully astonished to know that their records were so low, men who really believed that they were doing better than anyone else; they couldn't see themselves in their true light, and that is what a census like this will bring out. A man can see himself as he is, see himself as others see him, and if that won't start up his ambition, I don't know what in the name of God will.

Mr. Marty: The understanding between me and these forty patrons is about like what Mr. Goodrich has stated. Any one can find out about his own record, and of course he can't find out about his neighbor's. I could not have got the information if I hadn't made that arrangement.

Prof. Emery: Will you give us the highest and the lowest figures again?

Mr. Marty: The smallest and the largest return per cow in two herds of the forty. No. 15 had eight cows, mixed breed, rather poor dairy type, fresh March and April; feed, timothy and clover hay mixed and corn fodder, worth $12.75; ground grain—barley, oats and corn—worth $6.04. Pasture, $6.00, making a total cost per cow for the year of $24.79. Returns from the cheese factory, $31.12; net profit per cow, $6.33.

No. 8 had thirty-five cows, full blood Holsteins, freshening March and April. Feed, timothy and clover hay, shredded fodder, worth $12.75; bran and corn worth $10.55, pasture, $6.00, making a total cost per cow of $29.30. Returns on this factory number are $100.57; net profit per cow, $71.27. There is a difference in the returns from the factory of $69.45 and a difference in the net profit per cow of $64.94, in favor of herd No. 8. As to the figure charged for the hay, grain and fodder at $12.75, I have taken a sort of an average, after I had seen all the farmers. There was a wide variation from one ton to three tons of hay per cow. One man told me it was three tons per cow; I investigated closely, and taking everything into consideration, I knew that he was not right. I took the figures largely from a good dairyman who had kept a record of the pounds that he feeds per cow and so I tried to average the thing

up. I have charged the cows with a ton and a half of hay at the rate of $8.50 per ton; that makes $12.75 for the hay. Then I have tried to get the price on shredded fodder; some say it is hardly worth the price of hauling it; I have taken a price of $2.50 per ton on the farm, so I have given two and a half tons of roughage, coarse feed per cow, every herd of these forty.

Mr. Goodrich: I used to figure corn fodder worth about half as much as hay and nearly half of it is waste in such hay as they would feed.

Mr. Marty: I noticed that Mr. Goodrich had figured three per cent of the animal's own weight per day for two hundred days. That seemed to me a good deal.

Mr. Goodrich: I haven't had any occasion to change my opinion of that.

Mr. Marty: I have asked an authority on this question and he says 15 pounds for 200 days will carry any cow, with grain feed of course, but you all understand that the farmers in this section here make no effort whatever to push their cows. When they have finished making cheese, their aim is to dry them up and give them at least two months and a half rest, and they claim with good timothy hay, or timothy and clover mixed hay, and corn fodder, that is about all the cows, as a rule, in this county got through the winter months,—a very little grain in the spring of the year after parturition. You must not forget that these are figures that I have received from every individual farmer according to his estimation.

Mr. Legler: How much did the cows that gave 7,000 pounds of milk receive of grain, besides the fodder?

Mr. Marty: I got those figures from the man himself, $10.55 per cow for the year, for grain alone.

The Chairman: In other words, about half a ton per cow.

Prof. Emery: Does that expense cover simply nine months and a half or twelve months?

Mr. Marty: That covered the feed for the winter months and the pasture for the six months made up the rest of it. Those cows during the winter months are practically dry.

Secy. Burchard: The point in this cow census is that some herds made a wonderfully good return and other herds did not

make a very good return, although they made some profit. The lesson to be drawn from it is that those who made a small profit should endeavor to make a larger profit, and that they can do it has been proven by their own neighbors. That is the reason this cow census was taken. Prof. Fraser told us yesterday and Prof. Otis this morning that there is a very great variation in herds, in cows and in the care that they have. The comparison of this county with Waukesha county is perhaps a little bit of self-glorification that is to be excused; the same conditions, however, existed in Waukesha county that exist here; some of the herds there made good money and some of them didn't make any. I am much obliged to Mr. Marty for the way he has handled this matter. I knew it would be a difficult thing here in Green county, more so than in any other county where we have operated, but I think he has done splendidly, and on behalf of the Association, I tender Mr. Marty thanks.

Mr. Everett: I cannot refrain from commenting upon this paper and adding, if possible, to what Mr. Burchard has said. In the first place, it is not a test of counties, it is a test of individuals. A test has been made by Mr. Marty, has been as honestly and correctly made as can be made, the returns being taken from the creameries. Now, it is the most valuable thing that has occurred at this convention for your Green county dairymen, if you will use it. If I lived in Green county and was conducting a dairy, I would find out, if I had to hunt day and night, who the man is that got $70 per cow, and I would try to do the same thing he did. It wouldn't be a matter of jealousy, but I would try to find out how he is doing it. Just look at the difference between what these men received per cow, neighbors in the same county working under the same sun, hauling their milk through the same snowbanks, conditions all the same, except the man and the herd and the feed and the cow, and one got $71.27 profit and the other $6.33.

I said yesterday that the problem of dairying is the problem of selling feed, and that is all there is of it. A bushel of oats is worth so much in the market, and oats are worth just that price to feed to the dairy cow. I have seen a man haul a load of hogs four miles from home because he got five cents a hun-

dred more for them. Now that is intelligence, isn't it? We all know enough to do that. But why, in thunder, don't we know enough to sell our feed to a cow that will pay $3.40 for a dollar's worth instead of to a cow that will only pay $1.25 for a dollar's worth of feed? That is the only problem in dairying. Sell your feed intelligently, as you do your hogs; sell it to cows that will bring a big price for it. Get after these men that are making good returns and find out how they do it and do it yourself. You can all do it just as well as he can.

Mr. Davis: Did I understand Mr. Marty to say in regard to the poorest herd that he had the account of that herd for only six months?

Mr. Marty: No, the contracts run as long as there is any milk.

Mr. Chadwick: Aside from what milk was sold to Borden's factory, most of that milk was manufactured into cheese, not butter, isn't that so?

Mr. Marty: Yes. I found out this, which is against cows in this section, and that is, that there is too much waste on the average on both ends of the season, especially in cheese factories. In the spring, one farmer's cows are a little earlier than some others, and he is compelled to wait until his neighbor farmers are ready so they have enough milk at the factory to warrant starting the making of cheese. Consequently a man that is three or four weeks earlier with his herd is perhaps a loser, because he very seldom is equipped so that he can make butter at a profit. Then in the fall of the year there are the same conditions existing, sometimes the same man has milk at both ends of the season in that way, so that there is considerable loss to the dairymen of this county on that account. When it comes to making butter, the dairyman of this county is way behind as a rule—he doesn't make the butter that he ought to make.

Mr. Stauffacher: This cow census is a very interesting thing to the community, and I think that we as a community and the dairymen of Green county should take advantage of anything of this kind. I know we go to many places in the county and the dairymen tell us that all this is theory, they say

it is all right for those fellows up at the Agricultural College, they have got money, but it is theory for us. But here we have a cow census that is actual fact. These men say, "Give us facts and we will listen to them." I think Mr. Marty has gone around among our men and found out this and put it to us as a practical matter about our neighbors, so we cannot say any longer that it is a theoretical thing, and I think we should try to find out where we are at, all of us, and study up on these lines. I was raised on a farm and I know that we had cows that certainly did not pay their board; we simply kept them because they were good looking cows. It seems to me this county has too many cows. I know of a farm of a hundred and twenty acres keeping thirty cows and I know of other farms with the same number of acres keeping about twenty cows. Of course that would make a difference in figuring on the pasture, whether there were twenty or thirty cows. I believe Green county has more cows than can be taken care of properly. The people have been so energetic taking care of the dollar that has come in so rapidly during the cheese boom, that they have bought any kind of a cow. There ought to be five times as many farmers here as there are, but I hope those who are here will go back to their homes and investigate their herds and interest their neighbors. This is one of the best articles in this convention so far and I hope we will profit by it.

Mr. Zumkehr: This No. 8 is known to me, and he is a student; he is a graduate of the college at Madison and he studies his business all the time. There is not one cow in his herd I dare say that is not tested. He has got a Babcock test on his farm and every so often he makes a test of each cow's milk. If he finds one cow that does not do as well as he thinks she ought to do, she is taken from the herd. This gentleman has kept up that practice for a number of years, weeded out the poor ones and bred up to better cows, and therefore he has been able to show this record. I think it is very easy for any farmer to keep a record of his cows; it doesn't make much work if you are onto your job, to keep a record, not only for the weight of the milk, but also for butter fat. You can discard your poor cows you can breed up better, and in a few years you can make

a better showing, and if you farmers would go to work and keep a separate record of every cow, you would be surprised to find how many cows you have in your herd that don't give you any profit.

Mr. Everett: That is the story in a nutshell.

Mr. Marty: Mr. Stauffacher referred to this man here that only netted $6.33 for his herd. This of course is an average of that herd, and you can readily see that he must have cows in there that are worse than boarders.

A Member: Wouldn't it be well to give the name of that man, No. 15?

Mr. Marty: No, sir.

The Member: It seems to me it would be well for us to know.

Mr. Marty: You wouldn't think so if I should say it was you.

COW TEST ASSOCIATIONS.

H. C. Searles, Inspector, Fond du Lac, Wis.

In making a report of the work accomplished among farmers of Wisconsin, in the organizing of Cow Testing Associations, will say it has created great enthusiasm, and much interest is being manifested throughout the state.

We have organized fifteen Cow Testing Associations, which are located as follows:

Pioneer "Cow Testing Association," Eldorado, with 400 Cows.
E. Fond du Lac "Cow Testing Association," Malone, with 600 Cows.
Cottage Grove "Cow Testing Association," Dane Co., with 134 Cows.
Ash Creek "Cow Testing Association," Richland Co., with 100 Cows.
Tomah "Cow Testing Association," Monroe Co., with 205 Cows.
West Salem "Cow Testing Association," La Crosse Co., with 215 Cows.
Omro "Cow Testing Association," Winnebago Co., with 220 Cows.
West Bend "Cow Testing Association," Washington Co., with 343 Cows.
New Franklin "Cow Testing Association," Brown Co., with 175 Cows.
Wales "Cow Testing Association," Waukesha Co., with 100 Cows.
Rock Lake "Cow Testing Association," Jefferson Co., with 140 Cows.
West Depere "Cow Testing Association," Brown Co., with 266 Cows.
Medford "Cow Testing Association," Taylor Co., with 146 Cows.
Colfax "Cow Testing Association," Dunn Co., with 249 Cows.
Galesville "Cow Testing Association," Trempealeau Co., with 122 Cows.

Total ..... 3,415 Cows.

It is to the interest of every creamery or cheese factory management, to co-operate in the organizing of cow testing associations, among their patrons. If each one would put a shoulder to the wheel, it would be possible to organize a large number of associations this year. These organizations properly carried on, mean better cows for the farmer, more milk for butter and cheese, hence, lessening the cost of manufacturing. While cow testing associations in Wisconsin are practically in their infancy, the reports received from the various organizations are very satisfactory.

A letter received from Mr. Wm. Brennen, Secretary of the Tomah Cow Testing Association, says: "The farmers are becoming more interested as the work advances, and they have seven new members with others contemplating joining.

H. W. Griswold, Secretary of the West Salem Cow Testing Association, reports their association as being in a flourishing condition, with an addition of three new members and others to follow.

A letter from Mr. J. W. Benson, dated February 10th, in part says, "In accordance with your request, am sending you a brief report of our "Cow Testing Association" at Cottage Grove.

I wish to say at the outset, that this will be a statement of impressions and opinions and not a tabulation of facts, necessarily so, as our Association was only organized last July, and it is too early to present any definite deductions from the figures so far obtained.

I wish to say also that we have accomplished more than would appear from a statement of the number of cows tested; and the number of times they were tested. Cold figures cannot convey an idea of the enthusiasm, and the changed view point that this work has wrought among a few of our patrons.

Mr. D. W. Reynolds, President of the Cottage Grove Cow Association, is very enthusiastic in regard to the enlightenment it has given him. He says that he thinks it is the best thing ever taken up among the patrons, and he would not sell what he has learned in this test for any sum of money.

Mr. J. E. Killian, Secretary of the Association, says that this test has caused him to sell one cow which was shown to be of

poor stock. He also says the weighing and testing of each cow's milk is the only way of telling whether the cow is working for the farmer, or the farmer for the cow."

A farmer of Fond du Lac county, who is keeping daily records of each cow's milk, said he was more than paid for the time taken in weighing, by the extra amount of milk they secured. Also said they never recorded the weight of a cow's milk without noting the amount of milk produced the milking before, which stimulated them to feed and care for the cows much better.

Another farmer in the same county with a herd of ten cows found that the best cow produced 417 pounds of butter fat per year while the poorest one produced 133 pounds, and consumed within $4.00 as much food; a difference of 284 pounds of butter fat equivalent to $71.00.

The poor cow will tramp down and consume as much grass as the good one; in the stable she takes as much room, and when fed, will eat as much, but fails to recompense her owner.

Out of another herd of eight cows, the best cow produced 189 pounds butter fat per year, while the poorest one produced 71 pounds. Four cows of this herd failed to come to the 100 pound mark. This is a case where one-half of the number of cows are eating the profits made by the other half.

These vast differences can be shown in nearly every herd where farmers failed to keep proper records.

Time cannot be spent to a better advantage by farmers than keeping records of their cows, also treating them with kindness, and giving them good care, goes a long way toward making the dairy business a success.

Work carried on by the Wisconsin Dairymen's Association commencing May 1st, 1906, and continuing one year revealed the average amount of butter fat produced by four hundred cows, which was 199 pounds; two of this number produced over 400 pounds butter fat each, twenty-seven produced over 300 pounds each, one hundred and twenty-four over 200 pounds each, one hundred and ninety-nine produced over 100 pounds each, while forty-eight failed to make 100 pounds. As a result of this work, nearly 100 cows were elim-

inated from the farmers' herds. If this work could be carried on with every herd in the state, it would be the means of adding many thousands of dollars to the farmers' income.

A member of the East Fond du Lac Cow Testing Association headed his herd with a thoroughbred sire of a dairy breed, seven years ago. Two years later he began weighing and testing each cow's milk; at the close of the first year he found his cows averaged 210 pounds butter. The fifth year's work of testing was carried on by the Wisconsin Dairymen's Association which found that his cows averaged 352 pounds of butter per cow. This change was brought about by breeding and eliminating unprofitable cows, replacing them with profitable ones. You will note the great difference between the first and fifth year's production per cow, which is 142 pounds butter, equivalent to $35.50, allowing 25 cents per pound for butter. Does it pay to look well to the production of each cow in the herd? This man is a very enthusiastic worker for the upbuilding of the dairy industry, and has done a great deal toward making the East Fond du Lac Cow Testing Association a success.

If all farmers could realize the benefits derived from cow testing associations we would have very little trouble in getting them together to organize.

The dairy breeders' associations located in different parts of Wisconsin, as a rule, furnish excellent material from which to organize cow testing associations. One can very easily see why this is true, for these farmers have taken the first step toward the upbuilding of their herds. They are the most enthusiastic members we have to carry on such associations. We find so many men who think it occupies too much of their time to weigh and keep records of their cows; some of these men are keeping twenty cows while ten good cows would produce more butter than the twenty, yet these men are perfectly satisfied to work for the twenty poor cows, finding no fault with the time wasted on them.

Dairying is profitable if we will only meet the demands of the dairy as we should. We must discontinue keeping cows that are not fit for the business.

DISCUSSION.

Mr. Loomis: Why is it that there seems to be more interest among the patrons of creameries than among the cheese factory men in establishing these testing associations?

Mr. Searles: I would say because they are paying on the butter fat basis. The Swiss cheese factories and the brick are paying by the 100 pounds of milk.

Secy. Burchard: The same thing is revealed by the weights of milk, isn't it?

Mr. Searles: Yes.

Mr. Goodrich: Is the milk weighed of every cow the whole year around?

Mr. Searles: We had twenty-six patrons that year. Twenty out of the twenty-six weighed their milk every day, after the first two or three months.

Mr. Goodrich: How often did you test?

Mr. Searles: Once every month; we take two milkings, night and morning, and I would say that comparing that with the creamery test, when the year was up, we came within .04 of the creamery.

Mr. Chadwick: Which had the more butter fat, the night's milk or the morning's milk?

Mr. Searles: I found there was more in the morning's milk than in the night's.

Mr. Goodrich: Did you find that the case at all times of the year, or was it in the summer when the period of time between the night's milking and morning's milking was shorter?

Mr. Searles: That was in the summer.

Mr. Goodrich: Didn't it go the other way in the winter time?

Mr. Searles: Sometimes it did.

Ex-Gov. Hoard: How did you find the sentiment of the people where you were trying to introduce this testing system, how did the farmer feel about it?

Mr. Searles: In some places they are very enthusiastic over this work and take hold of it readily without much work on my

part. In other places, it is impossible to start them; they don't seem to have any idea what it is for. I have even been asked if it was a tubercular test.

Ex-Gov. Hoard: Where it is impossible to start them, do you find that they have been doing any dairy reading of any kind, informing themselves?

Mr. Searles: Well, from sizing the men up, I should judge they did not.

Ex-Gov. Hoard: In your opinion what is the most needed among this class of farmers?

Mr. Searles: Well, they need to get after their herds and find out what they are doing. If they could realize something of what they are doing, I think they would wake up. The trouble is they do not realize really what they are doing and they are satisfied not to.

Ex-Gov. Hoard: In the cow censuses that we have taken we have covered over two thousand herds, and about forty-five per cent of the farmers we found do no dairy reading whatever.

Mr. Searles: I have seen lots of them that take a dairy paper but never read it.

Ex-Gov. Hoard: There seems to be a great indisposition on the part of the men who are keeping cows in Wisconsin and everywhere else, against making themselves intelligent and I can't understand it. I don't see why the dairy business should make a man contented to be ignorant.

Mr. Searles: We find that when they once get started on finding out what their cows are doing then they will go right along.

Ex-Gov. Hoard: Do you in making this report allow each man to see what his neighbor does?

Mr. Searles: Yes. I figure out and show them and tell them how their neighbors were managing and taking care of their herds and what returns he got.

Ex-Gov. Hoard: Don't you think that it would stimulate the farmers of Wisconsin tremendously if in every cheese factory and creamery a test was made of that character and put up so that A could see what B was doing and what C was doing and all the way down, a monthly report? A had so many cows

and got so many pounds of milk worth so much at the cheese factory; B had so many cows giving so many pounds of milk worth so much at the cheese factory. There are thousands of men who don't believe but what their cows are doing just as well as their neighbors, when very likely they are not doing half as well, and the reason they stick to that belief is because there is nothing to show them. The cheese factory and the creamery have the knowledge, but they don't give it to the patron, and it seems to me it would be a great thing if every patron could know exactly what is going on, not only in his own herd, but in those of the other patrons.

A Member: About ten years ago I tried that myself in a creamery, but I found the farmers, for some reason, were so constituted, at that particular place anyway, that it lost me about ten or twelve of my patrons, because it started a jealous feeling among the patrons, and they got the idea that we were giving one man a better show than the other. In fact, I tried it in two different places, and I found that it takes a lot of nerve and hard work to overcome that feeling among the farmers. We had their numbers on our sheet, and also the name.

Ex-Gov. Hoard: Yes, I know how weak human nature is. In my cow censuses you will notice that the men's names are not given. The numbers appear from 1 to 100, but if every creamery and every cheese factory would take just such a census every year and give the patrons by number on the sheet, then these men could see that there was a wonderful difference in the different herds in that creamery.

A Member: I even went so far as to take a test machine and go out among the people and show them, and I would often take my buggy and go to a man that I thought needed a little information and took him to his neighbors, who were doing better, but I found it wouldn't work at all.

Ex-Gov. Hoard: It might not work in your factory, but that very thing showed that it ought to work.

The Member: Of course we had strong competition among the creameries, and that was bad, and if I had a patron that he thought I didn't treat him just right he would go over to the

other fellow and maybe that would have been a good thing in the long run, because it would weed out the poor factories.

Mr. Hill: Gov. Hoard speaks of the fact that in taking our cow census last year, each man thought his cows were doing a little better than his neighbors. Prof. Fraser and I were just looking over the figures of last year's census, and I remember that in one case in taking that census a man's own estimate of the butter fat from his cows was 275 pounds, and it turned out to be 88.2 pounds; he came within 190 pounds of it. Another man got 89 pounds of butter fat and he estimated he was getting 150. I remember another man Mr. Searles spoke of that got out of the test association because he found he was cutting out so many cows that he made up his mind that if he stuck to it he wouldn't have any left.

Mr. Chadwick: This is a question of education that has got to come.

Prof. Fraser: Gov. Hoard asked for a solution of this question, why dairymen do not read more. I would like to ask Gov. Hoard if he was taking care of that herd we had out on the chart yesterday how much time he would have to read, to improve his mind. That is the trouble with the dairymen in Illinois, that they do not read more. It is certainly a most lamentable fact. You go to the Elgin region and visit those dairymen most any time and they are very glad to see you, and if they had time they would be glad to stop to talk, but they simply have not time, they are so everlastingly busy milking those poor cows. On the other hand, if they would read and study the situation they would have more time.

Now, what is to be done about it I don't know. It is a question in my mind if we are not going to get men with more business ability, a more general understanding of business principles to go into dairying and produce milk, and a lot of these people that will not read will simply be driven out of the business.

Ex-Gov. Hoard: Prof. Fraser is right; there are so many men working with poor cows and they have to work so like blazes to keep them, that they haven't any time to read. Oh, there's an awful lot of poor cows in the country. I have tried

to figure up this thing with some of my neighbors. I can't make one of those men believe but what I am losing a great lot of money on my farm. They come to me and say frankly, "Now, Hoard, you keep four hired men and you pay out $2,000 a year for help. How, in the name of sense, can you come out?" Well, I say to them, "Do you think I am doing business for nothing? I keep all the help I want, that is the cheapest thing in the world for me to do, that is, to keep plenty of good, hired men. I have fifty people in my printing office, and I am hunting for a chance to keep fifty-one, fifty-two, fifty-three, fifty-five. I can't make any money on one pair of hands; no man ever got rich on one pair of hands, did he? If he is going to get rich in this world, he is going to employ a whole lot of pairs of hands." There is a farm of one hundred and ninety-three acres, and is worth a lot of money, $30,000, and there are a lot of men around me don't believe I am making a cent, and I know better. When a man will make a $30,000 investment and pay out $2,000 a year in the prosecution of the farm, he is going to get nine or ten per cent out of it if he can, and I have got a herd of cows there—why, a friend of mine came into my stable the other day and looked at them, an old German, and he says, "Hoard, if I had such a lot of cows as that I think I would be just as big a fool about them as you are." I said, "You would have a right to be. They are a good herd of Guernsey cows; they fill my eye, and they fill my heart. I look at them and I feel as though I ought to thank God for those beautiful animals that are doing so well for me; they are doing so well that they gave me 7,499 pounds of milk last year, and they made 425 pounds of butter per cow and they earned, skim milk that figured in, for me $117.17 per cow, and yet I have neighbors who tell me they don't believe I make it pay. They earned over their cost of keep about $80. Now, it is not a difficult thing for a man to go to work and stick right to it and build up a herd of cows like that; it is all in the possibilities of what can be done.

Prof. Henry: Do you get an extra price for your milk sold at retail?

Ex-Gov. Hoard: No, sir. I do get the price, but I am reck-

oning here on the creamery basis. I put it in butter, don't you see? Making 425 pounds of butter you can reckon it yourself by the average price at Elgin last year, $101.00.

Prof. Henry: Where do you sell your milk?

Ex-Gov. Hoard: I sell my milk in town and I am making a lot more money than I told you about, a good deal more. I sell that milk for six cents a quart, which is about $3.00 a hundred. But it is 5 per cent milk, and I have sixteen babies on my hands at one time. The women that had babies wanted the milk and the doctors were just pushing me hard, sent baby after baby to me after this milk, because the barns, the cows, everything are kept right. The milk was good and the babies found it out.

I tell you one thing, my friends, sometimes it makes me mad to think how little the average farmer knows about the value of skim milk. Let me tell you what I get out of skim milk. I feed it in two ways. I know a fellow that fed $12 worth of corn to pigs last year and then sold them for $9, and he said he couldn't see where it went to. I told you yesterday about selling ten grade calves to a man for $25 apiece. Now, those ten grade calves I kept a regular account of what they consumed. In seven months they consumed a little short of 3,000 pounds of skim milk and I fed them fifty cents' worth of bloodmeal, just dried blood that you get from Swift & Company or Armour & Company in Chicago. It is a splendid mixture to put into milk for your calves. I fed them fifty cents' worth of blood meal, a dollar's worth of oats, and a dollar and fifty cents' worth of alfalfa hay, that made $3.00. I counted the carcass worth $3.00 more, and that made $6.00. I sold them for $25 and I credited the balance to the skim milk, and that made 3,000 pounds of skim milk bring me $19, and that is 63 cents a hundred. I heard my good friend, Mr. Clawsen, say here that in the old days they thought they were doing first rate if they got 60 or 63 cents a hundred for their good milk. I got 63 cents a hundred for my skim milk, turned it into a calf like that. What I got from my thoroughbred calves I couldn't tell you. When I sold those grade calves to that man I sold him ten registered calves, reared in the same way, for $1,500,

$150 apiece, so you see that when turned into a registered calf the skim milk went way up, but when put into a grade calf, just such as any common farmer can produce, I got 63 cents a hundred for my skim milk. That same man gave as high as $30 for such grade calves. He came on from New York and wanted a carload, and he couldn't get them from me, so he picked them up from the neighbors round about. I have one neighbor, a German farmer, one of the brightest we have in our country, a keen, sharp fellow; he took a 170 acre farm on shares, and got $2,000 for his share, the net income of the whole was $4,000. That man sold calves to this Mr. Minor for $30 apiece, and yet there are plenty of men who will say, "You can do it, Hoard, but I can't." They are feeding their calves anything and everything, and when a calf is six or seven months old he is stunted, he is driven back, and you never can make up for that as long as you live. I tell you this, as true as there is a God in heaven, that a heifer is made or unmade the first year of her life, very much. If she is well nourished the chances are that she will make a fine cow. You crowd her down and push her back and stunt her, and if she would otherwise have made the finest cow in the world, she falls back and never gets over the atrophy of those organs which have been reduced by starvation.

Now, I have developed in fifteen years a good many cattle, sold a lot of stock, grade stock and registered stock, and I have had but one heifer that I have developed in that length of time that I could not make produce 300 pounds of butter a year. She was a Guernsey, and while I believe in blood and I believe you want to give a heifer the best kind of father you can find for her, at the same time there is a wonderful sight more than you think of in the way a heifer calf is reared and nourished and kept going. I am very fond of oats for feeding calves; I am buying oats and grinding it with a little corn for my calves, and they get it right straight along, and a heifer will cost me something like $35 when she is two years old; but when she comes in with her first calf she is right up and a-coming. I have got one today with her first calf and I can't dry her up; she is giving sixteen pounds of milk today and she looks as if

she is going to give 400 pounds of butter fat. If I had taken that heifer and used her as fifty per cent of the farmers use their calves, she would have been a failure, I believe, even though she has got the best blood in her.

Mr. Everett: I am going to tell you something about Gov. Hoard. He doesn't know that I know it, but I do know it, and I am going to tell you about it. I have been on the governor's farm a good many times at Fort Atkinson, and all over it; I watched his cows, noticed the way his barn is built, been out into the hog pen, seen him throw corn over in to the Berkshires, and then throw them some alfalfa, and I have time and again seen them leave the corn and go for the alfalfa hay. Everything he has told you is true; his is one of the most intensely practical farms that I know of; everything is absolutely within reach of every common, ordinary, everyday farmer. He hires everything done, everything goes like clockwork there, although the governor does not work there himself, but his brain directs everything that is going on. The last time I was there last summer, there were several of us, Mr. Hill was there. But with us was a young man who keeps the governor's books, covering all the operations of the farm. I said to him, "How much money is the governor making out of that farm?" He says, "I have no right to give away such information, but I will tell you that he did make last year, after paying for all the help, taxes, everything, he had a net profit of $2,700." That is my little story. If the governor doesn't like it, it is out and you have got it anyway.

Prof. Emery: I have been impressed today as never before with the value of the sessions of this association. They seem to me so valuable in bringing out the necessities if we succeed in handling cows, and I have been wishing that every young man in the state of Wisconsin who is to be a dairyman could have been here at this session this afternoon.

I apprehend that the real, the main reason why so many dairymen in Wisconsin and elsewhere are not making the most of their opportunities comes first from habit. We are creatures of habit. The schools, the common schools and the high schools and the normal schools and the universities, do their work sim-

ply in the fixing of habit, habit of mind, habit of muscle, habit in forming ideals and habit in executing them, and so I think that our reforms cannot come about as revolutions, but they will come about through evolution; they will come about through the education of young men, through the training of young men, having these young men who are to be dairymen form new ideals, better ideals than those old ones which can be greatly improved. If they could have been here, every one of them, if they could have seen the strong force that is working here, and if it could have worked upon their minds to give them some new ideas, some new purposes.

Brother Everett told you that one of the reasons why Mr. Hoard succeeds on his farm is because he is using his mind there. He told you just one-half the truth, and I will tell you that in my judgment there is another reason why he is succeeding there; it is not simply that he is using his mind, but that he is using his heart in that establishment, and when he stood before you this afternoon and told you how he looks upon his cows—and if any one had ever visited that farm with him and seen how he looks upon that plant, you will understand that his heart is in that plant, and that is the main reason why he succeeds, and I tell you the reason that some of us do not succeed as well as he does is because our heart is not in our business; that cow that we have is not regarded as an animal that should receive our highest interest, but it is made a makeshift and we find our interest, not in the care of that cow, in watching her, in the development of her calf, we do not find our enjoyment there, but we find it off somewhere else, perhaps in the corner grocery or—shall I say—in some saloon. The old saying is that where our treasure is there is our pleasure, and until we can find our pleasure on our farm in carrying out these ideals, we shall never reach the highest contentment.

There is one other thought I would like to leave; where I am living there is a young man, a very keen, bright young man. He left the University of Wisconsin, pursuing the literary course, and entered a machine shop in the city of Madison, one of the largest machine shops in the state, and he went into that shop because he was fond of mechanics, he liked to work. It

seemed strange to me, because I knew he was a young man who delighted in cleanliness, but he evidently likes it. He began at the very foundation, took the first work, and he worked away there until he knew all the work of that vast shop, knew it thoroughly, and finally when he had become a master workman, his employers paid him extra, and turned him loose to go through that shop, and for what purpose? For the one purpose of reducing expenses, trying to find means here, there and everywhere, in little ways and large ways, to reduce expenses in that great establishment, and he has made himself so valuable in that work that those men could not afford to part with him.

But by and by there came another story; he married a lovely girl and his father-in-law has a large department store in one of the cities of Iowa, and he wanted some one who had a personal interest in that establishment to keep track of all that was going on and help reduce expenses, and so he has been putting out inducements to that young man to leave this establishment and come over to his department store for the simple purpose of going around that store to study and carry out plans here and there to reduce expense.

There is not a farm in this country that doesn't need just that kind of oversight to bring out greater profits, and we have seen in many of the suggestions thrown out at this meeting how expenses can be reduced in many ways on our farms.

Mr. Legler: I wish Gov. Hoard would please give us the rations of those calves of his, the amount and kind of feed, from the time they are dropped until they were sold.

Ex-Gov. Hoard: That would be rather difficult to do. We start in feeding a calf after the first day or two. He gets about four quarts of milk a day for two or three weeks, being careful not to overfeed him. I like to satisfy him but not to overfeed, in order to avoid stomach troubles. That is one reason I put in this blood meal. A calf is first fed four quarts of his mother's milk and he is gradually reduced to skim milk, he slips over to skim milk say from the first four weeks to eight weeks. Great care is taken not to overfeed him, but the calf is kept growing right along. This one thing we must always remember about a calf, and that is, that the calf is a baby, and must be

kept dry. Every intelligent mother will tell you that a baby will sicken unless it is kept dry and clean, and that is just as true of a cow's baby as it is of a human baby, and so a large amount of bedding is used in the calf pen. It is an earth floor with cinders renewed every year and a great abundance of bedding which is shavings or straw. It is renewed every day and then it is sprinkled with disinfectants all the time. The aim is to keep that little calf barn just as pure as can be. It is not all in the feed; it is in this protection against infection. You crowd a lot of calves together like that and they spread infection to one another, you have to watch and keep the little fellows free from vermin, all the time look out for them. Now, they begin to thrive and when they are six weeks old, they are taken off of all new milk, they get nothing whatever but warm skim milk, fresh from the separator, clean, warm, fresh skim milk with a little of this blood meal in it, and they are kept clean and everything is done to keep those calves healthy. We start in with a very small amount of this blood meal, half a teaspoonful, never running as high as a tablespoonful, I should say about two and a half teaspoonfuls in a day. I begin feeding that along when they are about a week old and I feed it twice a day. I take the calf from the cow after nine milkings; I keep the cow with the calf until she passes the milk fever stage. While I do not dread the milk fever any more, as I used to, I keep the calf with her that long. If such a thing develops as a case of milk fever, I cure that cow up quickly with the air treatment.

Mr. Legler: You have got as far as eight weeks old with your calf.

Ex-Gov. Hoard: Then I go on carefully, enlarging the feed as fast as I think is wise, increasing the amount of skim milk and gradually carrying him over until he commences to chew the cud, which he will do at the end of six or eight weeks. Now then, there is a transformation in the stomach, from what I call the rennet stomach over to the ruminant stomach. As long as the calf is in the rennet stomach—and that condition is determined by the fact that it will coagulate milk—as long as that exists, you must be exceed-

ingly careful about putting solids in his stomach, but as soon as the calf begins to chew a cud, begins to eat, it wants a small amount of solids. I watch him and if I think I am coming along too fast for him, back I go. The calf is fed ground oats and a little corn meal and grain feed. At the beginning, if you feed too much alfalfa he will scour very badly, so be very careful about that. Those three things stand there, Mr. Legler, the three points, that is, feed—but the care of the feed and the care of his condition and all that I believe is worth more to him for the sake of his thrift, or as much at least, as his feed. You are one of the best raisers of Holsteins in the country, what is your opinion?

Mr. Legler: I have fed about the same. The only point I wanted to get at was about the amount of grain and the amount of skim milk that the calf got at three or four or five months old.

Ex-Gov. Hoard: There is such a difference in calves.

Mr. Legler: I know, but the average. I was at your place and I saw about fifteen or twenty calves. The average breeder would probably have that many or more.

Ex-Gov. Hoard: At about three months of age the calf is getting about from eight to twelve pounds of skim milk a day, according to its condition.

The Chairman: Do you think that that furnishes that calf drink enough?

Ex-Gov. Hoard: No, he has water right there all the while. There is a tub of fresh water standing in his stall. Let me tell you how my calf pen is made. Here are low stanchions on three sides and the feeding alley right behind. The calves are all put in stanchions and they are held there and given their milk in pails and then they are kept there until they get over that sucking mania which they have got. You know calves that get only skim milk are perfectly frantic to suck something. Then they get to their grain ration and then the alfalfa is spread before them and they are opened out and allowed to run loose in this place. They work around in there and every day that is fair they are turned out and let skip and run in the

barnyard and take a little exercise. I commence very lightly with the grain; I feed them not to exceed a quart a day up to the time they are three or four months old, but with the alfalfa and the grain and the skim milk I have managed so that it takes about a dollar's worth of oats when a calf is seven to eight months' old, and it takes about $1.50 worth of hay for the whole length of time, counting hay worth $10 a ton. It is worth more now. A calf is put in a little 4 by 4 pen when he is first born. It is raised up from the floor so that whatever liquids there are will leech right through onto the main floor. There is a doorway and a little rack for that calf, and it stays there until it is five or six weeks old and then he is put in with the rest and they run together. I think I am not doing right in just one particular, and that is I think I ought to grade them more according to their size. When they all get together, after four weeks this hay is put before them. I think I spend more thought on my calves than I do on my cows, and I have had pretty good success.

Mr. Goodrich: Will you dare let me talk a little?

The Chairman: You may.

Mr. Goodrich: We have had splendid lessons showing the difference in cows, the difference in breeds, the difference in feeding and the difference in care, but there is one part of this cow business that has only just been touched on a little bit, and that is in the milking. You may have the best bred cows in the world; they may be cared for in the best manner and fed in the best manner, and the milkers may knock the profit all out. This getting milk from a cow is a wonderful thing. Do you suppose that Mr. Gillett would have dared to let anybody else milk Colantha 4th's Johanna when he made that test? There isn't a man on earth that could have done as well as he did if he had changed, isn't that so, Mr. Gillett?

The Chairman: I don't think so. I didn't dare chance it anyway.

Mr. Goodrich: In the first place, milk is a product of nature whereby the mother feeds her offspring, and there is love and maternal affection goes with this act of giving milk, and unless the milker can, in some measure, take the place of the

calf in the affections of the cow, he never can be really a successful milker. You know cows sometimes hold up their milk. Why? Did you ever know of a cow or a heifer holding up her milk from her calf? No. She wants to feed the calf. If she doesn't like you, if she hates you, she won't give down her milk, that is sure. I have had experience with that. The first cow that I ever had didn't do well the second year I had her, she didn't produce only about half what she did after that, and it was because I had a milker that she didn't like. We must have the good feeling of the cow. If a cow hates you, I tell you she is not going to do much for you.

I was going to say something about the milking machine, but perhaps I hadn't better. I visited a barn last summer where they had three milking machines and I am awfully afraid that the cows won't fall in love with the machine as they would with a good milker; maybe they will. When I see a cow like a machine so well that she would follow it around and lick it and moo and ask for it to milk her, then I will think it is just as good as a good milkman or a good milking woman.

Secy. Burchard: Mr. President, I would like to have you resign that chair to me for a moment or two. I am one of the past presidents of this association and I think I am entitled to it. I now take great pleasure in introducing to you Mr. Gillett of Rosendale, who is about to be displaced as president of this association, but he had the distinguished honor during this past year to own and personally care for and feed the cow that holds all the world's records for economic feed and milk production. Mr. Gillett, will you get up and let the people see you?

Mr. Gillett: Mr. Chairman, Ladies and Gentlemen—I am taken somewhat by surprise and I am feeling a little bit weakened just now. This dairy question is something that has appealed to me ever since anything appealed to me. The subject of fine stock of whatever description has been a part of my life in which I have always felt a deep and intense interest. I can remember when I was a little boy when I was out of school on Saturday, we used to have a herd of Shorthorns in our village. I used to tease my father on Saturday to go to Rosendale, and

when I got there I would go on the mile and a half farther and spend the afternoon with Mr. Mattison's herd of Shorthorn cows. So I have always had a fancy for fine stock.

My father established a herd of Holsteins thirty years ago, and I have had active charge of this herd for twenty-one years. The second year of my father's breeding operations, he went east and selected the old imported cow, Johanna, then some ten or eleven years old; she was owned by Garrett S. Miller of New York, and was bought on a special order from Holland as being one of the finest cows of the Holstein-Friesian build from Friesland at that time. It was from this cow that we built our foundation herd, and later we purchased Colantha, another imported cow, for which we also paid a very large price, and it is the cross of this Colantha upon the Johanna family that has produced the great cow Colantha 4th's Johanna. Colantha 4th's Johanna is in my estimation as perfect in type, conforms as closely to the ideal conformation of a Holstein-Friesian cow as any animal I ever saw. I have always entertained great hopes of her capabilities, as I also entertain great hopes of the capabilities of other cows now in my herd from which we hope to hear later and which are of similar breeding.

Colantha 4th's Johanna, unfortunately, and on the other side perhaps fortunately, did not breed for a term of three years. At the age of four years she showed such wonderful development, and freshened on June grass, and not knowing of the present system of treating milk fever and having lost so many of our valuable cows with milk fever, I did not dare to again breed her to come in on an older form of grass, consequently we intended to carry her over, and have her come in again next fall. I think through this management she failed to breed, and she consequently did not have a calf for three years. I will say, however, that during her four-year-old form, she milked with us nearly 20,000 pounds of milk, making nearly 700 pounds of butter fat. The year previous, the third year, she milked over 15,000 pounds, and the first year, at two years old, she made over 12,000 pounds.

Secy. Burchard: How do you know?

Mr. Gillett: Because we weighed the milk and tested it.

Now, it would be a natural supposition that this cow had a long rest during these three years that she did not have a calf, but she did not. The first year of that time, as I said, she milked nearly 20,000 pounds of milk. She kept right on milking unceasingly, and at the end of 370 days, from her freshening as a four-year-old, we made an official seven-day record with her in which she made over 15 pounds of butter. She continued right along and to such an extent that I was fearful even at four weeks before she had her calf that we were not going to get her dry, but we did, and she came in in very fine condition, with the exception that as she turned out to exercise two weeks before freshening, she accidentally broke through the stable floor and broke one of her ankles, so that when she freshened she was very lame, but in other respects was in very fine condition and did nicely. We started her on a grain ration of about twelve pounds a day, and the first seven days of her test she showed 24 pounds of fat. Her feed was made up of gluten and bran, two parts by measure, with one to three pounds of oil meal, according to the conditions and the advance of period. She came right on, gradually increasing, and as we increased on her rations she responded very readily. I remember when she had reached 24 pounds of fat in seven days, I wrote Superintendent Gardner, and when I told him what she had done, I mentioned that she had been having about 16 pounds of grain a day, and he wrote back, "You are starving your cow," but I assumed, being on the ground and having had some acquaintance with her, that I was as well qualified to judge of the situation as Mr. Gardner was at long range. So we went on and I guess the results are pretty well known to the dairymen of the state of Wisconsin. This cow milked for a period of 365 days, an average of 75 pounds and a little over per day. She showed an average of 3.71 pounds of fat per day during this entire period. She was not bred during this time, but is now, I hope, safely in calf, and the day before I left home she milked over 55 pounds and it is sixteen months since she calved, so that even if she does not have a calf within the next year, I feel pretty confident that in the second year of her period of lactation she will produce over 15,000 pounds of milk.

Now, if there is anything in regard to the handling and the details of the feed of this cow, I shall be glad to explain.

Mr. Everett: What is she worth?

Mr. Gillett: All I can get.

Mr. Everett: Will you take $10,000 for her?

Mr. Gillett: No, sir.

Mr. Everett: What did you sell her son for?

Mr. Gillett: Eight thousand dollars cash, and I have another son that that would not buy.

Secy. Burchard: That is because you want to keep him, isn't it?

Mr. Gillett: It is because I propose to try at least to make Gillett's name and herd still more famous by the use of that sire.

Prof. Henry: How long have you and your father been breeding these cattle?

Mr. Gillett: My father established the herd thirty years ago, and I have had the management for twenty-one years.

Secy. Burchard: Who milked and fed this cow?

Mr. Gillett: I did.

Secy. Burchard: That accounts for it.

Mr. Gillett: And I noticed that when I didn't do it that she didn't do it either.

Mr. Goodrich: The milking, you mean?

Mr. Gillett: Or the feeding either. I spent one week at the National Dairy Show, and when I came back I found that cow down twenty-five pounds a day on her milk.

Mr. Goodrich: Did she recover it?

Mr. Gillett: Yes, she recovered within four days after I got home, but it was due to a little mismanagement that I was not there to correct, and the minute I saw her I knew what was going on. But there is one thing in the management of dairy cows, and it is this, it is the sense of perceptibility, the sense of conception.

Ex-Gov. Hoard: Seeing things.

Mr. Gillett: Yes, seeing things. To be able to detect things in a dairy cow, in her condition, in her surroundings, in her feed, all that goes to make up a favorable environment, that the

man must know. There is something about it that I can't tell you, neither can anybody tell you; it is an intuition born, I believe, with the man.

Secy. Burchard: You weigh the milk at every milking. Now, does that give you any indication what the cow ought to eat or ought not to eat?

Mr. Gillett: Not always. I don't know that I ever saw a cow vary so in her milk yield as she did during the first sixty-five days of her test. Some days she was up and down as much as ten pounds a day and she would have periods of going along just like a clock.

Ex-Gov. Hoard: She did not settle to her work for about sixty-five days?

Mr. Gillett: She didn't seem to. Still there was not that variation in the fat product. There was great variation in the percentage of the total fat.

Mr. Everett: What was her greatest milk yield for any day?

Mr. Gillett: One hundred and six pounds.

Secy. Burchard: And when you got that what did it indicate to you?

Mr. Gillett: It was so wonderful that I got pretty nervous, I expected an explosion of some kind, but it didn't come. It did not seem to me possible that a cow could produce four pounds of butter fat a day and be in her normal condition, but she did it and she went right on, kept right on doing it.

Mr. Hill: I want to tell one or two things about that cow that Mr. Gillett won't. He has got a boy home that is just as much interested in those cows as he is, that is, considering the boy's age. Along in the middle of the test, sometimes the father would have to be gone for a milking, or for a day or two, and that boy would take care of the cow and he would feel just as bad as his father if things didn't go all right. He would say he didn't know what papa did to that cow that made her give five or six pounds more than she did for him, but later on, when they came to test another cow, Mr. Gillett himself admitted the boy could do as well as he.

Mr. Gillett: And that is true; he got "next" to that other cow in a way I did not.

Prof. Emery: This just illustrates what I was saying a while ago of the effect that interest in a man's business, interest in his cows has. I don't believe any one of us can doubt that Mr. Gillett took a great deal more pleasure in taking care of that cow than he would have taken in some carefully planned amusement.

Ex-Gov. Hoard: Playing "seven-up", for instance.

Prof. Emery: I don't know much about that, but I know he found his interest, his pleasure in that work, and then he had faith in that blood; faith enough to stick to it for twenty years, using his intelligence in trying to improve his herd and to benefit it. This same pleasure is open to some degree, indeed a very large degree, to the young men of the state of Wisconsin if they will go into the dairy business, select their cows intelligently, and put brains into every branch of the business, and they will find it is a life of pleasure and happiness, for pleasure and happiness always come with success.

Prof. Henry: I wish to call the attention of our citizens to the honor that has been brought to our state through this work of Mr. Gillett. Wisconsin has been advertised all over the world by the work of this man. It has increased the value of every farm and every cow in the state.

Now, don't forget, when you are asked to support the state institutions, or asked to come to a convention or asked to help in forwarding any work of improvement, don't forget that you can't escape these things. Men are coming a long distance to this state to buy cows. We had a Japanese boy who came and studied with us eighteen years ago. He came into my office one day and handed me a letter of introduction from H. B. Gurler, and that letter said, "Professor Henry: This young man has come to study dairying with you. You will find him a splendid young man. He has no money; can't you give him work?" I did give him work enough to pay his board and clothe him, and he studied cows, kept studying cows. Well, I supposed he was like those Orientals I have heard about. I doubted about his

being very energetic, but he did good work and kept at studying cows. At the end of five years I said to him, "If you will stay with us and work for one year, I will give you good wages." "No, I can't do it. I study one month more, I study cows, then I go to Illinois to study cows." And he went to Illinois, he studied there and got money enough to go back to Japan. Nearly eighteen years later, Sen came to see me. I said "God bless you, you have come to see me. Tell me, Sen, about yourself." "Well," he says, "when I go back to Japan, I had no money, but I got a dairy." I said, "How did you start a dairy?" "Well, I borrowed a cow, I gave $25 one year, one cow. I borrowed some pasture and I feed her a little bran and I sell milk." I said, "And what have you got now?" "Why, I got forty cows now, two cows Holstein and Jerseys, pure bred." He told me all about it, twenty grade cows and those cows were worth from $200 to $400 apiece, and he owned fifty acres of land worth $150 an acre. Well, I said, "Sen, what do you come back to America for?" "I come to study more in the school with you, then I buy some cows." And before that boy went back, he left $7,000 in Japanese money in the state of Wisconsin for cows, and some of our boys were saying, "By George, I believe I will go over to Japan to make money."

Now, here is a man who has made a reputation throughout the world right here in Wisconsin and there are others who are making a fine reputation for the state. There are other boys in this room doing that very thing. We want the fathers of this state to bring up their boys so that the boys will love the farm and love cattle, because they are good. Those boys that talked about going to Japan to make money were foolish. There are just as good chances around here as in Japan. We have all the conditions for success right here if we will only get together and use them. One of the most foolish things that can be done in this country is to use a scrub bull, and the man that does, shows his lack of intelligence right there. Gov. Hoard can get $25 for a grade calf, and it isn't because he is Governor Hoard, but it is because some man is willing to give that amount for that kind of a calf. At Lake Mills year before last they shipped out $140,000 worth of cattle; men came here from

all over this country. It takes from thirty to fifty thousand cows to supply the districts south of us for shipping milk into Chicago and St. Louis. Now, we are selling those cows from $10 to $40 a head, cheaper than we could get for a better kind of cows fed on practically the same feed if they were better bred. Don't you know that a nice looking grade cow of any of the dairy breeds will bring from $10 to $25 more if she shows style in her breeding and it costs but very little more to feed her.

There are gentlemen here now from Barron county; they are working up next year's convention already, and I will guarantee there will be a thousand men in that hall if the weather is all right. We have had farmers who have chartered trains and come down from Barron county for two days' work at the Agricultural College, and those farmers have gone home and organized breeders' associations, they are testing their cows for tuberculosis,—we had to send a professor up there to travel around with some of their men when they went around to buy pure bred stock and they are buying pure bred bulls by the dozen up there.

The southern part of the state is not up to its opportunities, considering its market possibilities for stock. Our students the other day formed a Guernsey Breeders' Association at the Agricultural College, with sixty members; they formed a Holstein Breeders' Association with sixty members, and they have an Ayrshire Breeders' Association. There is a boy in this room now who is going to breed Ayrshires; six or seven boys in one neighborhood are going to breed one kind of cattle.

In this region you ought to be breeding nothing but one kind of cattle so that when a man from Elgin or any other place comes around and says, "I wonder where I can get a nice carload of cattle of a certain breed," we can tell him, "Why, go up to Monroe; they have a splendid lot of grade Holsteins up there at $80 a head." These men won't stop at $100 for the kind of cow they want, but they want a certain kind. Now, in Wisconsin, if we use pure bred registered bulls and kill every scrub bull in the state, it will raise the value of property in the state millions of dollars. Over in England, even the dogs are well

bred. In this country the dog that comes out and barks at your wife as she drives by, look what a cur he is.

Ex-Gov. Hoard: He would be ashamed of his grandfather if he knew who he was.

Prof. Henry: A boy came to the Agricultural College the other day and I asked what brought him, and he says, "I was graduated from the Fond du Lac high school, and it was my intention to take the engineering course, but father bought a Holstein bull a few years ago and the calves are all black and white and they looked so nice I began to take an interest in them and father was down attending the Farmers' Course and he heard you preaching against the scrub bull and he got kind of ashamed of himself and we looked over the herd and we said, "The red cows have all got to go, we will have nothing but black and white. I am going home to be father's partner, and I would rather be a farmer than a civil engineer." When boys begin to talk that way, it counts. We have four boys that have been in our college four years studying agriculture; I went to each one of these boys and said: "If you want a position as teacher in the college starting at the bottom, I can give you from $500 to $800 or $900 the first year you go out. Now, do you want me to look up such a place?" And each one of those three boys said, "No, Professor, I can't do it." Three of those boys are going to breed Holsteins and one is going back to breed Guernseys, all on Wisconsin farms, and they can't afford, as they say, to go out and take such salaries as I offered them. One of those boys has only a small interest in a farm and another has to go out and take a farm on shares, but they know what they are after; and when a boy would rather be a good farmer than a teacher in a college or a breeder of cattle than a civil engineer that is certainly hopeful for this state.

A Member: Bully for the boy.

Prof. Henry: Bully for the boy, so say I, and there are a lot of them coming right along that same line and what a splendid thing it is for our young men to be doing some work out of doors that they love.

Not so many years ago nearly all of our young men were rushing for the cities, but now the tide is turning, the city men

are becoming very anxious to live upon the farm, to be breeders of cattle or carry on some agricultural work, they are concluding that it is better to do that than it is even to be a lawyer or a doctor or to follow any other profession.

Adjourned to 9 o'clock, next morning.

The convention met at 9 o'clock, Friday morning.
President Gillett in the chair.

The report of the committee on Resolutions was received and adopted as follows.

To the Wisconsin Dairymen's Association,

GENTLEMEN: Your committee on resolutions begs leave to report the following:

Resolved, That the accommodations furnished by the citizens of Monroe, for the convenience, comfort and entertainment of this association have been all that could be asked or wished.

Resolved, That the splendid banquet furnished by the Woman's Relief Corps was a credit to that organization, and to the city of Monroe, and was highly appreciated.

Resolved, That the thanks of this Association are hereby extended to the retiring officers for their efficient and painstaking services.

WHEREAS, General George W. Burchard, for eleven years the Secretary of this Association, positively declines longer to serve in that capacity,

Resolved, That his long, faithful, very efficient and enthusiastic services as secretary of this Association, merit our highest appreciation; and that he bears with him our highest esteem and heartiest good-will.

Resolved, That this Association appreciates the honor conferred upon it by its retiring President, in the record made by

his Colantha 4th's Johanna, a record that excels that of any other cow for seven days, thirty days, sixty days, ninety days, six months and a year, and a record that adds luster to our state that has given to the dairy world a Brown Bessie, a Loretta D and a Yeksa Sunbeam.

WHEREAS, The Board of Regents of the University of Wisconsin at the suggestion of its president, Hon. W. D. Hoard, is considering ways and means of conferring some mark of honor upon farmers who have gained distinction and renown as such,

Resolved, That we are in hearty sympathy with the movement and urge its early adoption.

Resolved, That this association regards with a feeling akin to paternal interest and pride the splendid work of the Wisconsin Agricultural College and Experiment Station, established and brought to such a high degree of excellency, efficiency and usefulness, under the peerless leadership of that pioneer in agricultural education, Prof. W. A. Henry, and that his successor, Dean H. L. Russell, merits our confidence and will receive our cordial support.

Resolved, That the state and the nation owe it to the producers of honest food products and to the great consuming public to protect them against the evils of deleterious, adulterated, imitation, misbranded and fraudulent food products; and that dairy and food laws should be enacted and enforced with the purpose and with the effect of uprooting those evils and not with the effect of legalizing and condoning them.

Resolved, That it is the earnest conviction of the Wisconsin Dairymen's Association that the coming legislature of the state should enact a law making it compulsory on every creamery and cheese factory in the state to thoroughly pasteurize its skimmilk and whey in order that the spread of tuberculosis among calves and pigs from untreated skimmilk and whey may thereby be prevented; also that a law be enacted requiring breeding and dairy stock to be tested with tuberculin before being sold and transferred except for immediate slaughter.

Resolved, That the Wisconsin Dairymen's Association desires to repeat its utterances in the past years in favor of the making

of the Dairy Division in the Department of Agriculture an Independent Bureau and we call on our representatives in congress to take hold of this most needed work. Respectfully submitted,

J. Q. EMERY,
C. H. EVERETT,
W. W. CHADWICK.
Committee.

HISTORY OF THE SWISS CHEESE INDUSTRY IN WISCONSIN.

THOMAS LUCHSINGER, Before the Wisconsin Dairymen's Convention, Monroe, Wisconsin.

Mr. President, Ladies and Gentlemen of the Convention:—The subject that I have for my theme this morning is not so interesting to the people of Green county as it might be to others who have never heard of it, or if they have heard of it, never had a clear idea what it is. Certainly, if the history of the state of Wisconsin should be written, one of the most interesting chapters in that book would be about the foreign cheese industry of Wisconsin. When I say the "foreign" cheese industry, I mean especially the Swiss cheese, Brick and Limburger. We do manufacture in this country other kinds, the Brie, Neufchatel cream cheese and others too numerous to mention, but not in such masses as the Swiss, Brick and Limburger.

In order to give you a clear understanding of the origin of our Swiss cheese industry in the state of Wisconsin, I will have to go back to the old country where it originated thousands of years ago in Switzerland.

In Switzerland they have what you call the Alps. We call them the Alps in a more common sense, that is, for the reason that there are pastures on what we would call in this country the foot hills of the mountains. Way up, about four, five, six, yes, twelve miles from a village, up on the slopes of those foothills there are pastures. They contain perhaps from four hun-

dred to six hundred acres of land, some of it pretty nice land, but too far away for tilling and some of it is hilly, stony, and affords good pasture, some of it better for goats than for cows, for a goat will still jump where a cow cannot walk.

Now, those pastures every year are put up at auction by the community—they are communal property, and they are put up at auction to the highest bidder, and generally three, four or five men form a partnership and they bid at this auction and rent those pastures, and when they have not cows enough of their own, one of them perhaps owns four or six cows, another three and another perhaps two, and a good many own but one, but they go about during the winter and rent those cows at a certain rental, and then about the middle of May they go on what they call the first terrace of the Alps. These Alps are in terraces, one above the other, the first terrace, the second and the third. The lower one is called the third, then the next is called the middle and the other the upper. Up to these mountains they go during the summer, bring those cows and milk them, and the evening's milk is slightly skimmed.

Their factories are usually built over a cold spring; they always find a place where they can put one of their cheese factories' huts, as they call them, over a spring or a water course if near by. In this they put their evening's milk to stay until morning, then in the morning they skim it very slightly and take that and the morning's milk home to manufacture cheese. The cream is manufactured into butter. These things have to be carried down four, five, six and sometimes twelve miles; these men have something like a peddler's pack on the shoulder, made in the form of a chair. On that they load two, three and four loads of milk; one on top of the other, weighing sometimes 240 or more pounds. It is wonderful to see them with their sticks in their hands jumping from one stone to another. You would think an ordinary man's legs would break, but they jump from one block to another with a load of 240 to 250 lbs. on their backs, and go to the village and unload themselves and take back what little they need, and that little they need is not coffee, not sugar; it is merely some bread and some flour; that

is about all they carry back along with some of the things that they need for cheesemaking, and that is their life.

In the fall of the year, about the middle of September, about six weeks during the year they are on the upper terrace; then they come back to the middle terrace and toward fall they come to the lower terrace and very often they have snow, but they always have a little hay to feed the cows if the ground is too much covered with snow, and then later on they come down to this ground and are there for the entire winter.

Now, some of these people, who were doing this thing, settled in 1845 in New Glarus, a town about eighteen miles north of here, and those of you who know that country will realize that they were looking for some mountains. I believe they would have died if they had got out on the level prairie, although some of them have got used to even that. In that country they could have their hills, their water and there were about 140 of those persons and among them were a few cheesemakers. They were poor men, who did not own cows, but they were industrious. They came there and after awhile they would get one cow, and then after another while they had two cows, and a little while longer three cows.

A man would go and work for an American until he could buy a cow, and so, after a while, every one owned at least one cow, and sometimes two. In 1846 and 1847 more of them came and they had a little money especially there were two men by the name of Elmer, they came from Elm, and they were practical cheesemakers. They came to New Glarus and they found everything all right for their undertaking, and they began to work and began buying cows, and by the way, let me remark without any disparagement of Gov. Hoard or anybody else, they were as good judges of a dairy cow as anybody need to be. Those men certainly knew their business as anybody will tell you who knew them.

They went to work and bought a few cows and kept adding to them, though I think the highest number did not exceed ten, but very soon they began to hanker after the fleshpots of Egypt, or rather the cheese of Switzerland, and they commenced to manufacture it. They had no utensils, but they utilized what they

had and fixed up other things, and they made a rather large cheese weighing from twenty-five to forty pounds.

Very soon they manufactured more than they could use, more than they could sell in the market there at New Glarus, and they naturally began to look around to find out whether there wasn't anybody in the towns around who ate cheese. You all know that Swiss cheese is a very nice cheese, but still it has a peculiar odor about it, and the Americans didn't know what it was. It was a good deal like a hickory nut; the outside is sometimes bitter while the inside kernel is sweet. But soon their neighbors found out what the cheese was and they bought it to eat, but not to any great extent. It was mostly the German people who knew what Swiss cheese was from way back in their own country. There were more of these people down at Madison and they went to the Freeport country, and even as far as Milwaukee for their market, and finally there was quite a little market.

Now, there was only a small sprinkling of men who were able to make that cheese, for Swiss cheesemaking is an art. A good many Limburger cheesemakers tried to go into it, but I have never seen yet a Limburger or Brick cheesemaker that could make a success of the Swiss cheese business unless he took an apprenticeship in it. It is an art and it has to be learned. There is some mystery about it and those men were experts, some of them, and others became experts, and they made good goods, fully as good as we have nowadays. Still there were very few of those men that were making money; they sold their cheese for 15 or 16 cents a pound and their neighbors were making butter out of their milk, and some of them became wealthy. I doubt if those men realized more than from $8 to $12 per cow during the summer, while others got from $30 to $35 and even $40 per cow out of their herds. They saw that, but they couldn't help themselves, they didn't know how. It was not until 1873, when the great panic came and we had such a tight money market, a heavy, strong crop of chinch bugs and everything else—it became imperative for those men to do something else and when the misery was at its height, help was seen. Two men came from the East and proclaimed to these

people the gospel of the dairy business. These men said to these cheesemakers: "Here, you, who have ten cows, or eight cows, or six, why don't you get together and build a factory, and we will buy this milk of you and manufacture it into cheese." Those men wanted to see the money; they hadn't the confidence then that they have now in the dairy business, but they were told: "We will pay you from 55 to 60 cents a hundred for your milk, for all you will bring to our factory, and we will make it into cheese and we will turn it off and return you that money when we sell the cheese."

All right, it was done and the people commenced to see that there was money in it. Those who did not go into it saw that these people that sold their milk at 55 to 65 cents were getting money; they were wearing better clothes; they were commencing to pay off their little debts and everybody else wanted to go the same way, not only because there was some money in it, but they saw that their neighbors' land, by keeping more cattle upon it, was getting more productive and they could naturally keep more cattle. Factories sprang up at every corner.

Now then, we have a panic again, I think it was in 1877. The production of this foreign cheese—and I am speaking of foreign cheese,—by 1877 or 1878, had grown so strong that the supply exceeded the demand, almost twofold. Cheese accumulated on the hands of these milk buyers; there was competition, and a good many of them went to the wall. A good many have reason enough never to forget those years. When those men went to the wall, the farmers commenced to see that they had to bear the loss, they could not get from the cheesemakers any money for their milk and by and by they commenced to argue, if that is the case we can just as well go to work and keep our own milk. They had found out by that time that when there was a gain, the milk buyer did not divide up with them, he didn't go down in his pocket and say, "Here, gentlemen, I have made a dollar out of this milk, and it is nothing but fair that I should give you your share," but when the loss came the farmer had to bear it.

You will all agree with me that the man who keeps his own milk as well as the man who buys it has an interest in taking

care of it, and so in co-operative factories that same rule holds good. The cheesemaker dares to turn back milk from the factory to a man who has dirty cans and in a co-operative factory they would insist on his doing it.

I don't know whether folks are getting more honest than they used to be since we had the Dairy and Food Commission, but I think a lot of us have found out that it doesn't pay to be found out. Nobody likes that.

Now, a lot of factories were started up, co-operative and otherwise. We have now in almost each corner of a section, and sometimes in two corners, a cheese factory in this county. It is hard to give you any kind of an estimate of how many cheese there are and harder still to say how many Swiss cheese factories there are, for the reason that what may be a cheese factory today may be a Limburger factory tomorrow, and we can't keep track of them unless we keep a regular cheese census.

It is just as hard to get at the number of pounds that they have manufactured, unless we do that very same thing. I tried very hard for years to get some kind of approximate idea and the best I could find out was that the territory which is covered by our Southwest Dairy Association, which comprises pretty near the entire foreign Swiss cheese industry—that in that territory we have somewhere in the neighborhood of 400 factories of all kinds, and that the income from those factories is about in the neighborhood of $4,250,000; if anything, that estimate is too low. There is an industry that brings in that much money and I think it would not extend 30 miles either way, from a central point.

The income of Green county for every man, woman and child is $108.17. We have about 23,000 inhabitants in this county; we have more cows, by the way, than we have inhabitants, and—I don't know—perhaps it is a good thing. We have 23,000 inhabitants and each of them gets $108.17. Anybody can readily see that there is no business which pays better, in this county, at least, than the dairy business.

At that time we handled all round hoops; Swiss cheese in any other form was not to be thought of, but a few years back they commenced to manufacture what you call block Swiss cheese.

The block Swiss cheese is manufactured exactly the same as the other, out of the same milk and in the same press, I think. The block cheese can be made in a vat, but the round, globe cheese must be made in a kettle. The block cheese, instead of putting it in a round hoop, is put in molds, the pressure is a little different, a great deal similar to the brick cheese process. It is a handier cheese, though it is not quite as good a cheese; it is handier for the family and for small dealers. We are now manufacturing cheeses that weigh 150 to 200 pounds and over. If you want first-class, genuine A No. 1 Swiss cheese, you must go to New York and ask for cheese that was made in Green county, Wisconsin, a year ago, and they are not good in less time than that. They will give it to you all right but they will say it was imported cheese. You just turn it over and you will see the brand of some man here in Green county. They will sell it to you for imported cheese and you can't tell the difference. I don't know why we can't do that in this county. Perhaps it is because the cheese factories are small, the cellars are smaller than they ought to be and they can't take care of all the cheese they manufacture; they haven't sufficient room, and besides they need the money, and for that reason the cheese must go before it is fairly ripe. That is where the one great drawback is for our cheese industry that we sell our cheese before it is in proper condition.

Ex-Gov. Hoard: That is true of all the cheese made in Wisconsin.

Mr. Luchsinger: But it is more true of Swiss cheese than any other cheese, because Swiss cheese is absolutely not fit to eat until it gets up to a certain point of ripeness.

Ex-Gov. Hoard: When is Limburger ripe?

Mr. Luchsinger: Most any time, and the worst of it is when it is too ripe it is worthless. But Swiss cheese ought to have a certain time to ripen and that is what we do not give it; I will say at least four months from the time that it is first made. It does not become ripe enough for shipping until then, and it ought not to be cut before it is at least eight months old, and the longer you keep it from that time the better—of course there is a certain limit. A year or a year and a half is better.

Now then, we have shown you how it originated, how Green county got its first start in this direction. Other counties are now also making Swiss cheese; Winnebago county is a close second.

Ex-Gov. Hoard: They have one started in Barron county.

Mr. Luchsinger: Yes, people have gone all over the state from this county of Green trying to make cheese elsewhere. When these people came from Switzerland, these old Swiss folks had no idea that they would ever be their competitors, but they are to some extent. Switzerland has no greater competitor than its own children, here in Monroe and in the surrounding counties, and they are afraid of them; they can manufacture it as well; they have the country to do it in; they have the same conditions in the soil. Swiss cheese must have a lime rock foundation soil. They have tried to make it where there was no foundation at all, and they have tried to make it on gravel lands, Rock county and through Jefferson; they have to have that certain kind of soil which this country has. Those barren hills up in New Glarus and Electa, all through out to Burlington and Lafayette county is the kind to make Swiss cheese in. They do not know what they have; they don't appreciate for a minute a meeting like this and what may come of it to them, or there would be more of them here.

Ex-Gov. Hoard: I want to know if there has been any attempt made by you farmers here to study or determine the effect of the shipping away of all this fertility from their soil. The old cheese districts of New York have gone down tremendously in their fertility, and about five dollars of nitrogen is taken off the farm in the milk of every cow that makes 4,000 pounds. Has there been any attempt here to study that question, to know whether the old farms are still as fertile, are retaining their fertility or increasing their fertility?

Mr. Luchsinger: This is the very point I was going to make before I got through, and that is, that it has increased the number of cattle that we have here, but there is another condition attached to it; we don't want to let the compost heap lie in front of the barn. You must put it out where it belongs, and one of the clauses in every lease which I draw is that they must

haul out their compost and spread it where it is most needed. That is just as imperative as paying the rent. We know, because it has been demonstrated, that the land that would not yield anything thirty years ago will now bring the heavy crops of corn, while some of it is too heavy for oats, or some of the small crops. They have to plant it in corn, year after year, in order to keep the fertility down, it is too fertile.

Ex-Gov. Hoard: In Herkimer county, New York, I can buy land today for $25 an acre which fifty years ago was worth $70, because the fertility has run way down.

Mr. Luchsinger: In the Brick cheese manufacture we have strong competition, but as to Limburger cheese we compete with the world; we not only manufacture the most, we manufacture the best.

Ex-Gov. Hoard: It is a very strong industry here.

Mr. Luchsinger: Well, it is naturally strong; we have got so used to it that we like it, and when we go elsewhere and the odor of Limburger comes to our nostrils, we think of one dear Green county and it brings home to our hearts. Before five years ago Limburger was an unknown quantity in the United States, but now, out in the Panhandle district down in Texas, up in Maine, and way out in Washington and south to Florida, you will find our Limburger cheese today in every delicatessen place and in every high class saloon (so I am told), and we have no reason to be afraid but that we will keep right on, but the Swiss cheese industry is absolutely our own. Limburger has been and will be made elsewhere; Swiss cheese may be made elsewhere, but it cannot be made and will hardly be made by any but Swiss or the descendants of Swiss.

ADDRESS.

EDWARD H. WEBSTER, Chief of Dairy Division, Washington, D. C.

Mr. Chairman, Members of the Wisconsin Dairymen's Association:—Your Secretary asked me to come here and say something about the work of the Department of Agriculture and the connection that our work has with the great dairy industry of this country.

You have heard a good deal about the Swiss cheese industry, and know what it is from practical close contact with it here, but that is only one of the many other great branches of dairying in this country. When we come to consider dairying as a branch of agriculture, I think we can all feel proud of the position it holds, practically exceeded by none (unless it is the grain crop of this country) in total value, every year. It does not measure by any means the value of the dairy industry when we say that the milk production approximates $800,000,000; that isn't nearly all of it; that is indeed only one part of it; it does not take into consideration the yearly addition to the value of dairy live stock by better breeding, and the enhanced value of our farms. That value is probably greater than the $800,000,000, the amount that we get in cash from the products sold from the farm. So, I believe that we need not place dairying second to anything; that it is the greatest industry on the farms of our American people today, and it will remain so, as our country becomes more thickly populated and the land becomes higher in value. We will find that we need more herds on the farms in order to produce larger crops for our people, and other people who come to us for supplies. So the dairy industry is paramount, above everything else in agriculture, and I am glad to have some part myself in helping along the advancement of this industry with you.

It is only a few years ago that the Department of Agriculture recognized the dairy industry at all, and the Department of Agriculture has been in existence since about 1840.

Now, the Department of Agriculture is one of the greatest departments we have for internal improvement in this country, and is now employing about 8,000 people who are working under Secretary Wilson's supervision. These 8,000 people are engaged in everything which may be connected, directly or indirectly, with agricultural pursuits. It is only about twelve years ago that the dairy industry of this country was recognized at all in that department, and then it got in through a little bit of a clause put in the appropriation, stating that the secretary of agriculture had authority to collect and summarize information regarding live stock and dairying. Now it covers almost everything we can conceive of, from going out and asking a farmer about his herd of cows, to investigating the most intricate problems of dairy production from a scientific standpoint, and the dissemination of this knowledge.

The Department disseminates knowledge in various ways. In the first place we have our farmers' bulletins, specially provided for by congress, and the information gathered up by the workers of this Department and disseminated through this means is very valuable. Sometimes the writers of these bulletins are unable to present their scientific knowledge in a simple way and give it to us who have not had the advantage of scientific training. It takes a pretty big man to take a big scientific problem and so explain it that everybody can understand it. That is one means we have of disseminating information, and a good many reports have been published along dairy lines.

Then we have the scientific bulletins of the Department. These are distributed mainly through the colleges and libraries and scientific organizations of the country, although they are furnished to any one who wants them. These bulletins are not given absolutely free as are the farmers' bulletins. The scientific bulletins are limited in their distribution to any one working along the same scientific lines, but you can get them by paying a small fee or through your congressman; many of them have been put up for their special use in their own district.

Another means we have for disseminating information is attending meetings of this kind, and the Department has many

men out attending conventions of all sorts, many speaking on scientific problems and some on general problems, and that means bringing in closer touch with the people we meet in this way, the problems on which we are working. Too many men will not read bulletins, no matter how simple or how well written they are, indeed it is very few really that are reading literature of that kind; it is very few of the people on our farms that take agricultural or dairy papers which are the great disseminators of information in this country; altogether too few people take these papers or get any literature for use in their homes, and too few of us are taking that information and applying it on our own farms at home, and so there is a great tendency to put out men in the field who can come in direct contact with men on the farm, carry the information that the Department or the college or the university has to disseminate out to the farm. In our work we are attempting that in some ways. Take the dairy industries of this country, they have been more or less localized in certain sections throughout the country; and as we find out more about the conditions of the production and manufacture of these things, we realize that there is not any place in this country where dairying cannot be carried on in some form or other, and we are trying to spread this gospel of the dairy all over the country, because every section needs its help. When I speak of taking this work directly to the farm, we are doing that particularly in the South. In the South there are many miles of land that have never grown any crop but cotton, and their lands are worn out and produce much less than they used to. They have got to do something to build up that soil again, to return the original fertility or make it better, and those southern people are anxious to learn what they can. They know they need a change in their farm system and they are asking for help along that line. They want information concerning dairy and all live stock interests.

In our part of the work we have now fourteen or fifteen men working in the South, going right to the farmers and working with them. They go right to a man's farm and find out if he is interested in improving the condition of his farm, and we talk up dairying to them.

You must not be frightened for a minute, thinking that the work we are doing is going to cut out your profits; those people are not producing one tenth of what they consume. That country is developing at a wonderful rate; they have great opportunities and great markets to be built up, and that is true all over our country in regard to the home markets for our dairy products; we are not consuming what we could by any means of butter or cheese or milk, but the time is coming when we are going to eat more of the dairy products than we do. When we go to such men we make them keep records, we won't work with them unless they do, and they are anxious to do it. There are hundreds of farmers keeping accurate records all through the year, and they know approximately how much feed their cows are consuming. They are getting high prices for their products, eleven and twelve cents a quart for milk, and twenty-five to thirty cents a pound for butter the year round. They have also found they can keep a few cows on a cotton farm, and grow more cotton than they ever did before. The greater production they can have, the more money they can make, and the cheaper will be that production.

There is one question that is of great interest all over this country in the improvement of the conditions on the farm and in dairy circles, and that is the test associations. Some of the state dairy and food commissions are taking that up, but they are not doing one-tenth of what they ought to do; every community in this land should be organized into some sort of test association, putting it into a form to fit the conditions of each place, so that in some way you would get the benefit of those organizations as they are getting it in Denmark and Germany and Holland, and even over in Ireland where we are in the habit of thinking they are not advancing very much. There are several hundred test associations already organized there and they are becoming quite a competitor there in the manufacture of butter. They are beginning to get the right sort of stock on which to build their dairy industry.

We are hoping that we can extend our work in the different states along this line, and all the help that we are able to give we shall be more than glad to give.

There is too much poor butter on the market. Many buttermakers don't know how poor their butter is when it gets to market, and that is a condition that ought to be looked into. So we place men on the market to find out about this. The commission men, the creamery men, are asked to help to raise the quality of butter because it means raising the value of a product, so we are making this inspection. Our Chicago inspector, for instance, is called in by a commission man, because he has received a poor shipment of butter from Wisconsin. He goes in and looks over the butter, examines its faults; he writes out his criticism, and he sends a copy of that to the buttermaker or the secretary of the creamery, and a copy is sent to our office in Washington and a copy goes to the dairy commissioner of the state, and as soon as Mr. Emery gets that he will send a man to see what is the trouble.

Prof. Russell: A copy should be sent to the Agricultural Station.

Mr. Webster: I will see that it is. We have been able, on the money we have had, to put only five or six men on this work, but they are taking up the worst cases and going to the creamery and helping as they can.

Prof. Emery: Then I understand Mr. Corneliusen will go to the Chicago market and from there to the creameries where that butter is supplied to the Chicago market.

Mr. Webster: That is the idea. These men have instructions to work as closely as possible with the state dairy and food commissions. We all must work together as a unit for the advancement of this interest. We have calls from the Pacific coast for that kind of men. In fact, we find it very hard to find men enough to do this kind of work.

Ex-Gov. Hoard: There are two causes for poor butter—first, poor workmanship in the creamery for which the operator is solely responsible; and, second, poor management on the part of the man who produces the milk as to care, proper food, cleanliness, etc. Now, does your agent decide this thing so that it is possible that these two responsibilities may be traced back to the man?

Mr. Webster: We do; we have done so in many cases and it is our plan to follow this up. We try to get in behind the operator and get to the farmer, if it is necessary, so that every farmer in the community will know what is the trouble. Of course we will be limited in our field of operations, we must be, but our idea is to cover the cases that we undertake thoroughly.

Prof. Emery: There is one difficulty in this matter, and that is, that the buyers do not make a difference in price between good and bad butter.

Mr. Webster: That is one thing we are working after. This year our Minnesota people are buying their butter on the basis of quality. They are paying so much for butter scoring 95; so much at 92 and so much at 90, and making a considerable difference in price; and just as sure as the world, some of these days all the butter sold on the market will be sold on the basis of the score, and when that comes we are going to have another thing come in, and that is, that the federal government, or somebody with authority, will do this for him, so that it will be taken out of the hands of the men that buy the butter. So much for that side of it.

In our gathering up information we find that there are a whole lot of things we don't know. One of the things that has struck us with more force than anything else is that we know less about the secretion of milk or the changes in milk than anything else connected with the whole dairy subject. If we can find any way that we can throw light on the inside of the cow, that is what we are after.

A Member: One great trouble in this matter of the quality of butter is that the groceries make no distinction, they give the same price for all kinds.

Mr. Webster: The grocer doesn't buy it because he wants the buttter; he buys it because he can sell the farmers' goods. I know, because I have been there, and we never told a woman if her butter was bad; if we did, she would never come near our store again. The grocer loses money on every pound he takes in that way.

Speaking of this question of milk secretion, we have a number of men working on the question of milk variation, variation

in the composition; I don't know how long it will take, they are getting a good many interesting facts, but they haven't answered the question yet. But we hope to be able some day to answer a good many of these questions that are asked.

One question we have been working on for two or three years is the question of fishy flavor in butter, something that means losses to our commission men of hundreds of thousands of dollars every year, something that nearly every fellow has a theory on, and I don't believe any of them know much about it; we are very much in hopes that we have a pretty close solution, because we have some very marked results from recent work along that line, though we haven't gone far enough to tell what they are, and we don't want to have to take anything back.

Another great big question is the milk we drink in our cities. That is a question that both producer and consumer are vitally interested in, and where we have to work from both ends of the line, because we go to the farmer and tell him that he has got to produce better milk and he says, "I have got to have more money for it." And the consumer says he won't pay it. It is true, the farmer must have more money for his milk; it will certainly cost him more to produce it if he is going to take better care of it than he has been doing in the past. There was an international conference held in Europe awhile ago on that question of producing milk for cities. People are beginning to realize that they must have better milk; the death rate must be cut down. It is said that fifty per cent of the deaths of infants in our cities is due to the vicious milk they consume.

At the call of the Chamber of Commerce in Cleveland last week they got together three hundred farmers, who sat there ten hours to listen to talks on clean milk. They came in and asked questions and gladly listened, and they did it because they had been shown that it was necessary, that they had not only a financial but a moral interest. I think there will be a report of that meeting. Write to Dr. Sherman, Chairman of Sanitary Committee, Chamber of Commerce, Cleveland.

Mr. Chadwick: No milk is sold in this city without the cow is subjected to the tuberculin test. We have had such an ordinance for two years.

Ex-Gov. Hoard: But that doesn't stop the dirt.

Mr. Webster: No. Perhaps the first and most important thing is to have a healthful animal, and next, to have careful people handle the milk, and then to have clean, sanitary conditions, which means clean water as well as a clean place to handle the milk. We in our work have several men working right along this line to-day. The people ought to demand more rigid inspection, but they are not demanding it and they get all they pay for. However, the people are waking up on these questions and are going to demand better things, better inspectors and inspection.

Mr. Marty: The way the demand has been going in this part of the country for years it has hardly been considered worth while to try to make fine points in our dairy products. The demand of the market ought to be more uniform. I don't understand why there should be so many different kinds of markets for the goods that they can get out.

Mr. Webster: I see Mr. Marty's point, that is, the great variation in the products and the demands of the markets do not seem to correspond with each other. We must do a whole lot of education of the consumers of cheese and butter and everything else. We have got to educate the consumer up to the point that he will demand good Swiss cheese, good Brick cheese and good Limburger cheese and know what these are when he gets them and be willing to pay the price for them. It is a commercial proposition; in other words, while we are talking to the farmers about better conditions we must spend just as much time talking to the consumers.

Ex-Gov. Hoard: Hoard's creameries supply 2,000 families, and we had to instruct the wives of those families how to care for their butter after they got it.

Mr. Webster: Any amount of good butter and good milk is spoiled right in the house. They stick it in the refrigerator with a lot of vegetables, so it is no good by the time it is used. That is simply because of lack of proper information on the part of the wife, or many times of servants to take care of these things. The question of taking care of good food after we get it is just as important as the question of producing it.

One of our discussions in Washington this winter has been on the question of better milk supply in the city of Washington, and everywhere we found that necessity of teaching the housewife how to handle milk when she gets it. The same is true of cheese and all food products that come from the dairy farm.

This is a big problem; there is plenty of room for all of us to work together for the general uplifting of this great industry of our country and the subject as presented by Governor Hoard this morning in a resolution is simply an indication of what is going on all over the country. Our citizens everywhere are asking that the work be placed on such a plane that we can reach these various problems. We are doing it in a way now, but we could do it much more fully if we had better facilities. We want to employ more competent men to do the work as we want it done, and pay salaries adequate for the work they are doing. Just recently I lost one of the best men we had on the production of butter, simply because the Department could not afford to keep him. That man is worth more to the dairy industry of this country from a butter standpoint than he is worth anywhere else, because he had the knowledge, the practical experience, coupled with a good education, but he was offered very much more salary than we could pay and he had to take it of course. He was working for your interest; he is now working for the interest of one concern.

REPORT OF MILK AND CREAM EXHIBITS.

U. S. Baer, Assistant Dairy and Food Commissioner, Madison, Wis.

Mr. Chairman, Gentlemen of the Association, Ladies and Gentlemen.

It has been observed in some of the previous meetings of this Association, by reason of the fact that the buttermakers

and cheesemakers have formed themselves into associations by themselves, that the exhibits of butter and cheese grew smaller from year to year and but little interest was taken in them from the fact that the great majority of the delegates, who attended the convention, were only concerned in producing milk or cream for city market, or which was sent to the creamery or cheese factory. In view of these conditions the executive committee of this association, at its March meeting in 1906, passed a resolution which was in substance, that premiums should be offered for milk and cream and that premiums on butter and cheese should be discontinued. Through the persistent efforts of your Honorable Secretary, a milk and cream contest was held under the auspices of this association at its annual convention at Tomah, about one year ago.

It became a matter of great importance to know just how milk and cream could be judged, and personally I am free to confess that it was with a good deal of reluctance that the judges last year were induced to attempt the work on the occasion named, but Secretary Burchard told us that it was useless in his judgment for us to harangue about delivering good milk and cream unless there was some way devised by which the buttermaker or the cheesemaker could form some sort of an approximately correct judgment as to the quality of the milk or cream when it came to his intake. After careful thought, consultation and considerable experimental work on the subject, under Commissioner Emery's instructions and counsel, together with other members of the dairy and food commission, we found that by the use of various tests, the trained nose and taste that we were able to tell, with a fair degree of accuracy, the condition of milk and cream.

In order to make these contests perfectly fair, the percent of butter fat and milk solids not fat in the milk and cream must be ignored in these reports, however, I wish to state that every milk and cream sample entered has been tested for butter fat, specific gravity; acidity, fermentation and preservatives.

We, as inspectors of the Dairy and Food Commission, would naturally do that. We wanted to know whether they complied with the state laws or not.

Mr. A. E. Kundert, Asst. Chemist of the Dairy and Food Commission, subjected all samples submitted to us to his tests for formaldehyde and for borax, finding no trace of either just as he anticipated.

Mr. J. D. Cannon, Mr. Fred Marty and your humble servant were the judges. We found all entries to be far above the standards fixed by state law so far as butter fat and milk solids not fat were concerned. None of the milks indicated any treatment by heat or otherwise as rennet action in the application of the curd test was normal in every case.

I want to say right here that your exhibitors put up a very hard proposition in fixing this duty upon your judges. The milks and cream, though few in number, were exceptionally fine, far above the general average of market milks and your judges were put to a severe test in the determination of who was to get 1st, 2nd, 3rd and 4th places.

The scale for judging embraced the two essential items of flavor and condition. Flavor was subdivided into taste and smell and for milk 25 points and for cream 30 points were assigned to each. In the class for milk, condition was subdivided into, results of curd test, 25 points, cleanliness, 15 points, acidity 10 points. It being impracticable to apply the curd test to cream, condition was determined from cleanliness, 20 points, acidity 20 points. Total, 100 points in each case.

The judging was done on the basis of a numerical score card, each of the three judges scoring independently of the others.

The appearance of the packages or bottles containing the milk and cream was all first class.

No dirt or sediment whatsoever was found in the bottoms of any of the bottles.

The exceptionally high scores of all of the exhibits entered indicates, that all of the contestants were very successful in their efforts to produce a pure, clean, wholesome and high class milk.

I will now read you the average of all the scores made:

Milk.

Name of Exhibitor.	Address.	Flavor.		Condition.			Score.
		Taste.	Smell	Curd.	Clean-liness	Ac d-ity.	
		25	25	25	15	10	
J. G. Hickcox.....	Whitefish Bay...	25	25	24.5	15	10	99.5
John Waelti.....	Monroe	24	24	25.0	15	10	98.0
H. F. Ora	Manawa	24.5	24.5	23.5	15	10	97.5
Dallas Davis.....	Monroe	24.5	24.0	24 0	15	10	97.0
L. P. Martiny.	Chippewa Falls .	24.5	23.5	23.5	15	10	96.5

Cream.

Name of Exhibitor.	Address.	Flavor.		Condition.		Score.
		Taste.	Smell.	Clean-liness.	Acidity	
		30	30	20	20	
L. P. Martiny.	Chippewa Falls..	29.5	28.5	20	20	98.0

THE ECONOMICAL ASPECT OF BOVINE TUBERCULOSIS.

Prof. H. L. Russell, Dean, Agricultural College, Madison.

Mr. President, Members of the Convention:—A few weeks ago I received a letter from a man in Iowa, and in it he said: "Last month I bought a pure bred Holstein bull, paying $235 for it. I took the animal home, tested it for tuberculosis and found that it re-acted." He says, "Can't you tell me somewhere that I can go and buy a pure bred animal that is free from disease?"

A few weeks before that I got another letter from a man in Iowa, saying: "You people over in Wisconsin are doing

something with reference to tuberculosis. I am coming over there after my cattle. I am sick of trying to find the right kind of stock and to find it healthy; I am coming to Wisconsin."

That represents, gentlemen, the condition of affairs that is to be found in this state. Wisconsin is a great breeding place for dairy stock. There is no other state that has reached a higher pinnacle of success with reference to the breeding of dairy stock, and it is, therefore, incumbent upon us, above all things, that we see to it that the stock which is sent out from this state shall be free from this scourge of tuberculosis. When we have built up a reputation for breeding stock, and reached the degree of success which we have, we certainly want to have that accompanied by a further statement that not only have we got good stock, but that it is healthy stock, and a reputation along these lines means everything in the further development of the dairy industry.

If Wisconsin should develop the reputation that its stock was badly affected; that it was almost impossible for a man to buy a herd without introducing tuberculosis, our good name as breeding state will go just as it has gone in other directions.

See what, for instance, it cost the state of Wisconsin some years ago in regard to the matter of cheese. This state stood at the front, so far as quality of product was concerned, and then fell a victim to the fraud of making "filled" cheese. In a desire to obtain large returns, an illegitimate amount of returns, "filled" cheese, poured into our markets and away went our reputation as a state. It took years to win back this reputation as a producer of first class quality of goods, and was from every point of view a most expensive proposition.

The same thing is true with reference to the reputation of our stock. We must have it, not only good stock, but healthy stock. By eradicating tuberculosis from our midst we are bringing people to this state from all over the country and even beyond the bounds of the country—Mexico and Japan.

This disease was introduced into our state years ago; it came in from the East as a great many of the good things that

we have gotten in this world have come, but this is one of the bad things.

This disease has been introduced from some of the best herds that they had in New York, Pennsylvania and other portions of the East. The first herds to become involved in this state were probably those into which pure bred and high grade cattle were brought. In the laudable attempt to build up and improve the quality of Wisconsin's stock, they unknowingly introduced into our state the seeds of this scourge.

The Experiment Station herd went through a similar experience. When I came to the University of Wisconsin in 1893, we had a fine herd of dairy stock which had been carefully selected. In these early days practically nothing was known about bovine tuberculosis. One of the first things we took up was to give instruction to our Short Course students with reference to the application of this test. Four or five animals in our herd were tested as an experiment and every one of them responded to the test. Previously to that time no suspicion had been attached to the herd. This condition led to the examination of the entire herd, and of thirty animals, twenty-two were found to re-act at this time.

At the present time the breeders are in advance of the general public with reference to the consideration of this question; they have gone through the mill on this matter, many of them have learned from sad experience that when the disease once gets into their herds it is a scourge which is sure to cost them to eradicate an immense amount of time and trouble and money. A great many of them have, however, stamped it from their herds, so that at the present time, I presume that the condition of our breeding stock is better on the average than that of the general stock.

At the present time we find that not only individual breeders are strongly in favor of the tuberculin test, but Associations are taking hold of this matter and are using their best efforts to see to it that the entire number of animals represented in the Associations are subjected to the test. This idea is reaching proportions that extend outside of the state.

I have a letter here from one of the prominent Holstein

breeders of the state, saying that at the next meeting of the Holstein-Friesian Association, he is going to introduce this matter before that organization of making it compulsory that every animal that is sold by any member of that Association shall first register its condition as to whether it is affected with tuberculosis or not. If that measure passes this great Association of Holstein breeders it will do more to give a reputation of health to our pure bred stock than anything else that they can do, and naturally the results which will come from that kind of work will redound not only in honor and credit, but in dollars and cents from a purely advertising point of view.

At the present time the rank and file of the dairymen are taking hold of this matter in a far different way than they did a few years ago.

This year the subject of tuberculin testing has been introduced into the Farmers' Institutes. There have been eighty or ninety of these Institutes held throughout the entire state, and Superintendent McKerrow has had some one talking bovine tuberculosis at every one of the Institutes held, and he tells me there has been no subject which has attractd as much interest as this question. This is reflected in the applications we are now receiving at Madison asking for information relating to this subject; also demands for tuberculin for the testing of herds, and asking how it shall be done.

We are sending out a much larger amount of tuberculin than ever before. Within the last three or four months from the Experiment Station alone over 33,000 tests of tuberculin have been distributed.

Dr. Roberts, the State Veterinarian, is also dispensing large quantities of tuberculin; in many instances the stock owner himself is purchasing these materials in the open market, for the reason that he does not want anybody to know that he is going to apply the test to his own herd. I have no doubt but that there will be over 50,000 tuberculin tests made upon our Wisconsin herds this year. This represents the interest and enthusiasm which speaks well for the rank and file of the dairymen of this state.

But we find that this interest is not uniform throughout the state; that it is localized here and there in certain counties; that localization comes about in large measure by reason of the fact that our post mortem demonstrations have been the most convincing way in which the people have been shown the actual condition of affairs and wherever these post mortem demonstrations are held, we immediately see the response in the large numbers of applications for tuberculin from that particular district.

As indicating the irregularity with which this movement passes from one portion of the state to another, let me show you the results in two counties. For this purpose I have taken this county (Green), and one of the north counties (Barron). Up there they are new in dairying, having begun only a few years ago, but they propose to start right. Compare this new dairy region in Barron County with this old dairy region, Green County, and see about the interest that is manifested in this direction.

We have returns from 131 herds in Barron County; ten here in Green County. Nearly 1,600 animals have been tested in that one little county and but twenty-nine out of the 1,600 re-acting, or 1.8 per cent affected with tuberculosis. These people have taken hold of this matter at an early stage, before their herds have become thoroughly affected with the disease. By the expenditure of a few dollars and the elimination of twenty-nine animals at the present time they have saved thousands of dollars to that new dairy region within the next ten years.

In this county (Green) one herd alone not far from this city had twenty-three animals affected, and out of the whole number, 209, there were twenty-six.

Of course there are many other animals than here reported that have doubtless been tested; the application of the local milk ordinance in Monroe has undoubtedly resulted in the testing of a good many. The figures I give here are simply those that have been received from tuberculin which the Experiment Station has sent to these two respective regions.

The suggestive matter is that these new dairy regions of

the state are realizing the importance of taking hold of this subject in time, and in order to show the results based upon the examinations that have actually been made, I have charted our records on this dairy map.

(Here the speaker presented a map showing the distribution of tuberculosis by counties).

When we take, for instance, the tests which have been made in the northern portion of the state and compare them with those made in the southern portions of the state, we find that we would have in a line drawn across the state in this way and confining these tests to those particular regions where we have the largest number of tests, that on the average they have 8.6 per cent of tuberculosis in these counties represented here in this way. I have that expressed in another form in these counties.

Take the counties of Dane, Walworth, Columbia, Jefferson, La Fayette and Rock. Those are the counties in the southern portion of the state where the largest amount of testing has been done. We have tested 650 herds in Dane County, with 324 re-acting; the percentage of animals averaging 11.3 per cent. Fifty-one per cent of all of the herds which were tested in Dane County showed the presence of tuberculosis but only 11 per cent of all the animals tested showed presence of the disease. The results of the tests in Walworth, Columbia, Jefferson and Rock are indicated upon this map.

Now, there are two things I want to point out particularly on that chart. Eight and six tenths per cent on the average of all the animals tested in these six counties re-acted in the test, but 37 per cent of all the herds tested.

Now, you go up North and see what the condition is. These yellow lines here indicate the particular regions of the state in which this testing work has been carried on most extensively. But here in Barron county, up among the stumps, we have nearly 1,400 tests with 1.8 per cent of the animals reacting. Take it down in La Crosse County we find that there is only between 2 and 2.5 per cent. In La Crosse county the total number of re-acting animals were 27 out of 863. In Monroe county it is 2 per cent; in Outagamie it is less .03 of

one per cent out of 300 animals. In these newer dairy regions only 2.4 per cent reacted, but what is more important is that nearly one-fifth of the herds were affected.

You will notice then in comparing the condition in the North with that of the South that there is from three to four times as much tuberculosis in the southern portion of the state as there is in the North, and over double the per cent of herds.

That means, gentlemen, this one thing, that unless we take a hold of this matter and take a hold of it now, the North, in its condition at the present time, where it has only one quarter as much tuberculosis as we now have farther South, will have in a comparatively short time an increasingly large percentage. Here are one fifth of the herds into which the disease has already been introduced, but the extent to which the disease has developed in those northern herds is not as yet as great as it is in the southern portion of the state.

You see at once what this means to the great business of dairying; the importance of taking hold of this matter and doing it early enough so that the losses will be trivial, as they are at the present time. This work can now be done at a cost which is relatively insignificant in comparison with the expense which will be required in later years.

The southern counties need to take hold of this matter and agitate it, educate the people, because if we do not do that, the percentage of infection is going to increase, because this disease never dies out of itself.

When you look at the percentage of affected herds, you will see the significance of this statement. Disregard, for a moment, the percentage of affected animals in which you find a range of from 3.2 up to 11.3 as in Dane County, that is bad enough as it is, but when you look at the last column and see that from 30 to 50 per cent of all of the herds that have been tested show the presence of re-acting animals, this is a very much greater significance than the percentage of re-acting animals.

Now, bear in mind, that these tests are not from suspected herds, these are only the cases that have come to the Experi-

ment Station and asked for this tuberculin without any suspicion whatever that the herds were affected. I have eliminated from these statistics all of the suspected herds; those go to swell the report of the State Veterinarian. When a man knows that he has got tuberculosis, the chances are he would call in the veterinarian and that reduces very materially the numbers coming through this channel. When a man becomes convinced that it is advisable for him to learn what is the actual condition of his herd, he seeks to obtain that knowledge usually from the Agricultural College, so that our statistics combined with the figures we give would represent very much nearer the average conditions in the state than if we took the suspected herds.

Now, note the significance of this. In some of our counties, one half of some of our herds have got the seeds of the disease introduced into them. Now, how do they get there? For the most part those herds have become infected by those men buying in animals from outside sources. The necessity of taking hold of this matter at the present time is still further emphasized by the fact, that unless we do this and do it now, the disease is going to spread more rapidly in the future than it has in the past.

Why do I know that it is going to do that? I can show that in a most conclusive way by showing you the statistics of what has actually occurred in some portions of the state. The condition is this, gentlemen: When you have got a herd of animals in which the disease is present, the disease travels from one to the other of those animals until a larger and larger proportion of the herd becomes involved. Suppose now that you take the milk of that herd to a creamery; suppose in the beginning that your herd was the only herd that contributed infected milk to that creamery, the chances are that in that district sooner or later other herds will begin to contribute milk from infected animals to that same creamery.

Now, the tubercle bacillus does not thrive and grow outside the body of the animal, so there is no danger of the growth of the germ after the milk is drawn from the cow and one cow's milk diluted with hundreds of other cows' milk would

reduce the infection to where the disease will not be produced, but if you add to that one cow another cow's milk that is infectious, you finally reach a point where the milk of that creamery becomes so infectious that when the skim milk goes back onto the different farms, you spread death and destruction throughout the whole radius of that creamery. That is exactly what happens and what will happen in Southeastern Wisconsin with the continued progress of this disease.

Last year we found the condition of two creameries in Dane county to be such that when these herds were examined that out of 1213 animals tested in two creameries, 30 per cent of all those animals were found affected with the disease, and we found moreover that it was the young stock that were affected. That man who, for instance, only took his cream to the factory and did not take back any skim milk, we found he was free from the disease.

When we went outside of these two creameries to the surrounding creameries and examined their herds we found that the percentage of affected animals in eleven surrounding creameries was reduced to eight per cent in 1467 tests and almost every single case showed that the infection was attributable to the fact that each person had bought in from some outside source an animal affected with this disease.

That will hold in every creamery; the moment the skim milk becomes capable of spreading infection that is just what happens.

Now, notice on this map. There are those two creamery districts, Medina and Oak Park.

Every one of those red dots means a tubercular animal; the black dot means healthy animal. Within that red line showing boundary of creamery district thirty per cent of those animals responded to the test, outside of the red line the percentage was reduced to eight. Every particle of skim milk which went from that creamery contained the seeds of this disease to such an extent that it was capable of producing it in anyone's herd. That herd might have been free from tuberculosis, but he brought home tubercular skim milk, fed it to

the young calves and hogs and so introduced this disease in this way.

Gentlemen, that is what is bound to happen in Southeastern Wisconsin. It is not likely to happen in Northern Wisconsin for several years to come, because they have not enough tuberculosis there at the present time to produce this concentrated type of infection, but it will happen and is happening in Southeastern Wisconsin to-day. There is one creamery down near Burlington that is in that same condition. We found three creameries last year where this disease was being spread through the medium of the skim milk. We simply happened to stumble onto these cases in making tests that were made in the way that I speak of.

Now, it is entirely possible for us to stop this. All you have to do is to pasteurize the skim milk; that will effectually destroy the tubercle bacillus and so prevent the distribution of the disease in this way. This should be made compulsory by law and this was asked for of the last Legislature, and denied. The Legislature said, people will not stand for this and we are not in favor of doing anything that is compulsory in its nature.

Our surrounding states are doing this. Minnesota and Iowa have sense enough to see that they can accomplish the necessary object to some extent by compelling the skim milk of the creameries to be pasteurized before it is returned to the farms. The cost is merely nominal, the use of the exhaust steam makes no heavy demands from the standpoint of expense and the improvement of the quality of the milk itself which is brought to the factory is enough to pay for the whole process. Our most progressive creameries are doing it voluntarily, because they find it is worth while to do so, regardless of the question of tuberculosis. This should be made compulsory by law, that our creameries, especially in the portions of the state where tuberculosis is known to exist, should pasteurize their products. Denmark and Germany have done this for years.

I am not very much of a believer in legal enactment when we can get moral suasion to work and make it effective. There are some places where it is better to go slow and build up public sentiment so that that public sentiment backs up a

law, than it is to go rushing ahead and not have your public sentiment behind you, and consequently, from the standpoint of compulsory legislation, I have so far opposed the proposition of making the tuberculin test compulsory throughout the state at large. We are not yet ripe for that matter, but we can help along toward the taking of certain advancing steps, and I would like to see this State Dairymen's Association put itself on record as favoring certain legislative measures which will be brought before the Legislature this coming session, and one of those is this question of the compulsory pasteurization of skim milk.

The other, and the most important thing that we can do toward the further restriction of this disease in this state is to have stock, which is sold from one party to another, tested, in order to find out whether it is free or not. If we could secure at this coming session of the Legislature the enactment of this one law, that when a man sells stock it must be known to be free from this disease, it would do more to restrict the spread of the disease in this state than anything else that we can do. This spreading is being done most efficiently at the present time through public auctions and through private sales. Men are buying animals supposedly free from the disease only to find that when they do apply the test that they are affected with it.

We have been accumulating data along this line in connection with our work, and when the bill was put before the Legislature last year we put up there 200 cases, positively proved, where men had bought this disease by buying an animal and bringing it in from outside sources. This was not sufficient to convince the members of the Legislature; they had to recognize that there were positive cases but they didn't dare move in this matter until they could see that the people wanted it. So we have continued in this work of collecting data and we have a long list of cases, eighty-eight more cases are to be added to the 200 that we already had showing where men have bought tuberculosis and introduced it into their own herds in this way.

It is absolutely impossible for any man to go out and buy

animals at the present time in any considerable number without running great chances of buying in this disease unless you use the tuberculin test in order to determine their condition.

Now, this campaign which has been carried on in Wisconsin has largely been educational. The laws, which we now possess, have not been very radical. We have drawn a line around a state and we are not permitting any animals to come into the state until they are first tested, hoping thereby to be kept from being a dumping ground for infected animals from outside sources. But what are we doing with reference to the cleaning up of the condition of affairs within our own state?

If you as a breeder have tuberculosis in your own herd and want it there, I don't know as the law can prevent you from doing that, but the law certainly ought to be able to prevent you from disposing of that disease to some one else, that is, spreading it from your herd to some other herd through some innocent purchaser. We have statistics which show that certain herds in this state have spread the disease to four northwestern states. One case in Southeast Wisconsin we have the positive records showing that sixteen other herds in the Northwest have become infected through one herd in exactly that way.

How long can we continue to bear this kind of a burden and allow the fire to spread indefinitely in this way? The campaign that is being carried on in Wisconsin is being managed in my judgment in the most economical manner. The state is paying less for the eradication of this disease here in Wisconsin than any other state that is attempting to handle this question at all.

You may be interested as tax payers to know something about what it has cost for condemning animals. The way which we do in Wisconsin is to test the herds and then the animals which are found to be infected are shipped to Milwaukee or some place provided with a Federal Inspector, and the animal is examined and if the meat is satisfactory for use; that is, if the disease is only in the beginning stages, found in a single gland, for instance, in the throat or lung, where the muscular portion of the body is not involved, that meat is

sold and so there is turned back into the State Treasury some return from these animals affected in the early stages. I show here the net cost which has been paid by the state deducting these amounts, for the last five years. In 1905 it was $8,150; in 1906, $16,600; 1907, $17,700; that is to say, at an outlay of less than $20,000 a year, we are getting on top of tuberculosis in Wisconsin. Massachusetts spent a quarter of a million and covered only three counties. New York spent hundreds of thousands of dollars and there was a revulsion of public sentiment against the continued application of the test, and they abolished the law of New York and are just again beginning to give attention to it. You can't go down into New York state to-day to buy stock in any quantities without running the danger of buying tuberculosis. I have known a good many cases to have come from there.

If you have a fire smouldering in your barn, gentlemen, you don't wait until that fire bursts out into flames before you do something to stop it. A pail of water in the beginning will do more good than a whole troop of fire-fighters later on. What we want is the pail of water in Wisconsin and we want it right now to dump it on that fire at this present moment. We don't want to get into the condition that some of the older countries did. Denmark let this thing go until they had forty per cent of all their herds involved; then they were obliged to take it up and deal with it in the most heroic manner. We can save this state hundreds of thousands of dollars if we will continue this method we have had in operation the last two years, voluntary testing by stock owners themselves and the spreading of information through every possible source so that the stock owner may realize the nature and gravity of this proposition and deal with this question largely on an educational basis. The cost of such method of campaign will be merely nominal in comparison with what it will be worth and with what will happen if we simply shut our eyes and say that this is all a fad.

I leave it to you to draw your own conclusions as to whether you, as stock owners and raisers, will go on longer regardless of the condition of your herd, not knowing whether you have

got tuberculosis in it but simply taking your chances trusting to luck, hoping against hope, that you haven't got it, but not knowing.

This is an economical proposition that is before you; you cannot afford, gentlemen, to longer ignore the fact that this is the most insidious, but the most important animal disease that we have to combat in this state and a "stitch in time will save nine" without any question; it will save you dollars as growers and breeders of live stock and as dairymen, without any question.

DISCUSSION.

Prof. Emery: What is the relation of bovine tuberculosis to tuberculosis in man?

Prof. Russell: My talk was on the economic aspect of this question, and purposely I refrained from going into that phase of the question, but the answer to your question is this: There is a direct relation in this respect, in that the disease from the bovine can pass over to man through the medium of infected milk. The danger is probably much greater in the case of children than it is in the case of adults. There is now no question but that the disease can be transmitted. Prof. Koch, some few years ago, asserted that in his judgment the two types of tuberculosis were two separate diseases, and that there was little or no danger of transmission from one to the other, and that statement in itself did more to induce scientific effort. As a result of carefully controlled studies, the German commission has reported against these conclusions; the English and French commissions have done the same. A large amount of practical evidence has now been accumulated, which conclusively shows that a considerable percentage of the disease in the human race is to be ascribed to diseased milk.

Today we are considering the subject purely from the economic point of view, leaving, for the moment, this sanitary or hygienic point of view. If you have tuberculosis in your herd, you wouldn't want to use such milk in your own family.

A pertinent question is: Will you sell it for somebody's else child.

Ex-Gov. Hoard: We have a law preventing the shipping in of tuberculous animals, haven't we? Into this State?

Prof. Russell: Yes.

Ex-Gov. Hoard: Have we any law to prevent the shipping out?

Prof. Russell: Yes, the Federal regulation prohibits this under the interstate commerce law.

Ex-Gov. Hoard: This case arose in Jefferson County; a breeder of thoroughbred Holstein cattle had his herd tested. Ten of his best cows re-acted. A man who was buying Holstein cattle for shipment into Mexico went to him and offered him $50 apiece for those tuberculous cows; he said they were good-lookers and good enough for what he wanted. The matter rested on the honesty of the Holstein breeder, and it is a credit to the State that he refused to take the money. But there was a man right there buying animals and shipping them out of our county, and he said he didn't care a tinker's damn, as long as they were good-lookers. We must realize, more and more, gentlemen, how impossible it is to tell anything about the internal condition of an animal by its external appearance.

Prof. Russell: The one thing that has done more than anything else to agitate this matter in this state has been the public post mortem examination at State Fairs and County Fairs. The farmer has thus had a chance to come close to the proposition.

Last week up at Winneconne at an Institute held there we had two herds from Winnebago County which we used in a post mortem demonstration. One of them belonged to a prominent Jersey breeder, who is one of the directors of the Oshkosh Pure Milk Company, which is doing all that it can in a public way to show the community the necessity of using proper protection in this matter. He had used the tuberculin test on his own herd several years ago, and a number of his herd re-acted. He had paid the penalty by wiping out a large part of his herd. Three or four years ago he went down to Tennessee and bought a bull from a supposedly healthy herd and

placed it in his herd. He tested his herd a few months ago and found that about one third of them re-acted; some of these animals we killed at this post mortem demonstration. From the history they were animals that ought to have been in the early stages, because they had only been in contact with the disease for a few years. We found them in the early stages as we expected, though they looked physically bad.

The other animals were taken from a herd in which the disease had been present for six or eight years. Individually they were better looking animals, and everybody said it was a perfect shame to kill such animals.

Upon opening them, the lungs were found adherent to the ribs, the whole interior of the animal being rotten with the disease, so that when we stuck a knife into the lungs, the pus squirted out all over the table.

The tuberculin test will enable you to pick out an affected animal, regardless of the amount of infection in the system.

Ex-Gov. Hoard: A test was made out in Whitewater and several cows found affected, but I think that some of the animals sent to Milwaukee disclosed no tuberculosis finally. Now, I understand, do I not, that the federal officer does not carry out the test as you do?

Prof. Russell: I happen to know the details of that test. When temperatures were taken, it was found that they ranged from 103° to 105° before the tuberculin was injected. Under our rules the herd never should have been injected by anybody; it was not fit to be tested, in the first place, as they had a fever temperature to begin with. These animals were shipped to Milwaukee, and on examination by federal inspection failed to disclose any result of the test, and there was a great hue and cry that the state was killing animals that were perfectly healthy. Governor Hoard wrote me about that particular case, I looked up the facts of the case, and they were as I have stated, the animals had a fever temperature before the injection.

Another thing, when those animals go to Milwaukee or Chicago they are not examined to test the accuracy of the tuberculin test; they are tested to find out whether that meat

is wholesome, and only that. If the muscular portions have not been affected by the disease, the meat is perfectly safe for use, and the federal inspector passes it on that basis, so that if you go to Milwaukee and find that this animal or that animal has passed, it does not mean that it is not infected. You must bear in mind that the federal inspector is there for the purpose of determining the edibilty of the meat and not the accuracy of the tuberculin test, because the experience is that a number of cases have been found where tuberculosis has not been found in an animal which has re-acted theretofore, or found in such small quantities as to be practically negligible. I have handled several thousand head of this sort, and I never have seen but two cases where the disease was not found upon a critical examination after the test had been made. I remember one case where an examination of the carcass disclosed that it looked perfectly healthy and when the carcass was cleaved down the middle, there was an abscess right at the end of the spine. You may have it in portions of the body where it is not normally to be found. You can easily see that a casual examination made by a man who stands and watches a carcass go past him is no criterion of whether that animal is infected with the organism or not. You can go down to Chicago and examine stock as it comes from the ranches and you won't find one case in ten thousand that is affected with tuberculosis from that kind of an examination, or you can go to the slaughter houses and examine as carefully as you may the carcasses of animals that are killed for meat and you won't find the presence of the disease except in a small percentage of the ranch stock. Of course those animals are not tested before they come in.

I have a lot of bulletins here and they will give you a good deal of information on this subject.

BREEDING AND REARING THE DAIRY COW.

G. C. HUMPHREY, Professor of Animal Husbandry, Madison, Wis.

With something over twenty-one million milk producing cows in the United States, nearly one million one hundred forty-five thousand of which are in Wisconsin and no evidences of a milk famine at hand, we may question in our minds the necessity of discussing how to breed and rear the dairy cow. It may appear that there are as many milk producing cows in the country as we have need for. It is true, however, that there never was a time when the dairy cow was more popular and in greater demand by parties from all over the world than at the present time. Since January 1st, 1908, inquiries have been received at my office for a total of 196 dairy animals. This undoubtedly represents only a small number of the inquiries which have been received by all the breeders of the state, and indicates only in a small way the demand for Wisconsin bred dairy animals.

For the benefit of every Wisconsin farmer, who may have milk producing cows, I wish to emphasize the fact that the above inquiries received for dairy animals did not call for ordinary milk producing cows, but for high grade and pure-bred cows of some one of the distinct dairy breeds. They call for dairy cows in the strict sense of the term, *dairy cows,* and it is the cows of this class and not the common ordinary milk producing cows that are so popular and in so great demand.

From statistics which have been gathered, the valuation of milk producing cows in Wisconsin ranges from $21 to $31 per head, and the average production from 3500 to 4000 pounds of milk and 150 to 200 pounds of butter. Cows of this character and capable of no higher production are not dairy cows. They are common native scrub cows maintained at a loss, and better it would be for the farmer, if they were not maintained at all. There are many high grade and pure-bred cows which are producing annually from 8,000 to 12,000 pounds of milk and 300

to 400 pounds of butter, to say nothing about the choice pure-bred cows, which are producing 800 to 1,000 and even 1,200 pounds of butter, as a maximum yearly production.

When we make a distinction between the ordinary native milk producing cow and the strictly dairy cow, capable of economically converting the raw products of the soil into large quantities of milk, we begin to appreciate the importance of studying and discussing the matter of breeding and rearing the dairy cow. To the thoughtful studious mind, this subject should never grow old. It furnishes a broad field for investigation and contains many an unsolved problem, which we can only hope to solve by means of long continued work in scientific investigation.

In discussing the subject at this time, the writer will attempt to discuss only the fundamental principles which have become recognized as important factors entering into successful breeding, and which are adhered to by practical men who have achieved success in breeding and rearing dairy cows. They are principles which should be practiced by every dairyman who hopes to breed and rear dairy cows that shall prove profitable under the existing conditions of high priced land, high priced labor, and high priced feed.

To clearly bring before your minds what may be considered profitable cows, I call your attention to four animals of the University of Wisconsin dairy herd, whose productions and feed consumption I am able to quote. These cows belong to a much more ordinary class than do many of the more widely known cows, which we read and hear so much about, and my quoting their records will in no way lessen the respect and esteem we hold for cows like Colantha 4th's Johanna, Yeksa Sunbeam, Loretta D and a score of others, we might name, which are owned in Wisconsin. In considering the four cows and the profits, which have been yielded in a year's time, the following schedule of prices for feeds has been used, which are the average prices we have had to pay at the University Farm during the past winter.

SCHEDULE OF PRICES.

Mixed hay (per ton)	$12.00
Alfalfa hay (per ton)	14.00
Corn silage and soiling (per ton)	2.50
Sugar beets (per ton)	2.50
Dried beet pulp (per ton)	16.00
Wheat bran (per ton)	24.30
Dried distillers grains (per ton)	30.00
Oil meal (per ton)	30.00
Cotton seed meal (per ton)	30.00
Gluten feed (per ton)	26.00
Oats, (per bushel)	.535
Corn (per bushel)	.64
Pasture (per season)	5.00

In crediting the cows, the price of 26.8 cents per pound for butter fat has been used which is the average price we have received at our University Creamery during the past year. The price of 15 cents per hundred pounds for skim milk has been used and is as low as any farmer would consider it worth, although I am satisfied it is worth at least 20 cents per hundred to grow good well bred dairy calves. The calves produced by these cows have been valued at $100 per head when six months old, at which age they are marketable. In one instance we have received this price for one of the calves and could readily have received the same price for any of the others had we cared to sell them.

The first cow to which I call your attention is an Ayrshire cow, Christina, which at the age of 8 years and shortly after being imported from the state of New York, freshened November 3, 1906, and dropped a nice heifer calf. She produced 8,920.2 pounds milk, testing 4.5 per cent, and 361 pounds butter fat, equivalent to 421 pounds butter. Shortly after the expiration of her year's production, she dropped another pure-bred calf, which is to her credit as a profitable dairy cow. For the year Christina is credited as follows:

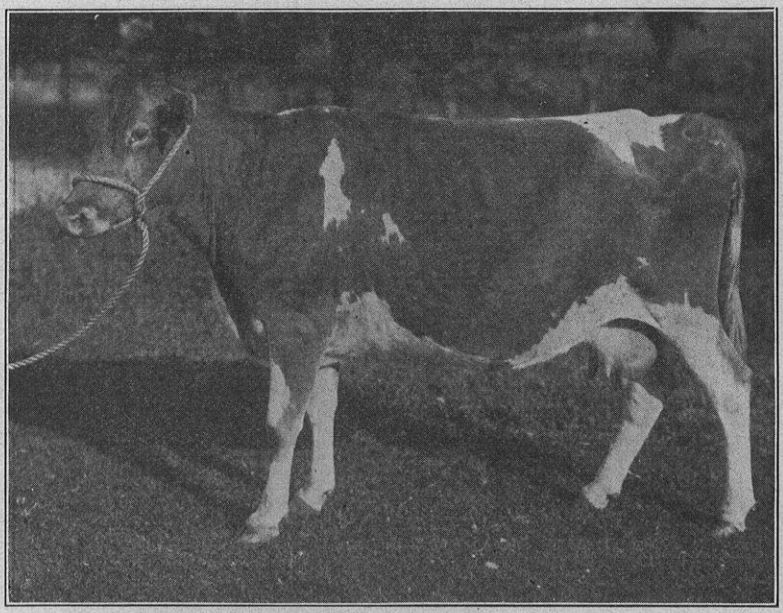
361 pounds butter fat at 26.8 cents	$96.75
7582 pounds skim milk at 15c per hundred	11.28
1 calf at six months old	100.00
Total value of products	$208.03

AYRSHIRE COW, CHRISTINA.

Year's record: milk, 8920.2 lbs.; test, 4.5 per cent; fat, 361 lbs.; butter, 421.0 lbs. Owned by the University of Wisconsin.

The second cow considered is Queen, a Guernsey, which bred and raised at the University Farm, dropped her first calf, February 7, 1906, at the age of 27 months. Her production for last year, was 7702.9 pounds milk, testing 5.12 per cent, and 394.7 pounds butter fat, equivalent to 460.5 pounds butter. Her second calf, a bull, was dropped October 7, 1907, and has been sold to be delivered when six months old for $100. Her first calf was equally as good an individual, and thus we credit Queen for her year's production as follows:

394.7	pounds butter fat at 26.8 cents ..	$105.86
6542	pounds skim milk at 15 cents per hundred	9.82
	1 calf at six months old	100.00
	Total value of products	$215.68

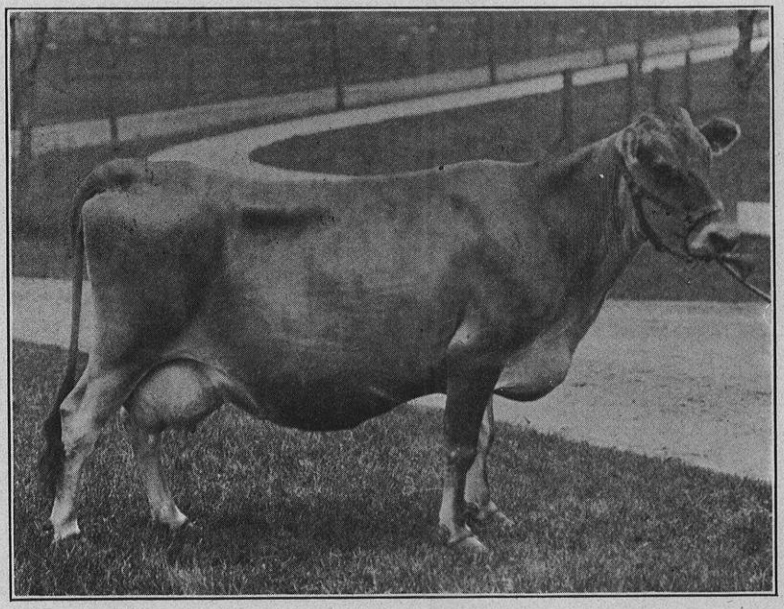


GUERNSEY COW, FAIR COZIES QUEEN.

Year's record: milk, 7702.9 lbs.; test, 5.12 per cent; fat, 394.7 lbs.; butter, 460.5 lbs. Owned by University of Wisconsin.

The third cow, to which I invite your attention is Macella, a Jersey, which at the age of 7 years, freshened October 3, 1906, and dropped a nice heifer calf. Her year's production was 9074 pounds of milk, testing 5.74 per cent and 521.2 pounds fat, equivalent to 608.1 pounds butter. Macella should also be credited with having produced another calf shortly after the expiration of her year's production. For the year considered Macella is credited as follows:

521.2 pounds fat at 26.8 cents	$139.63
7709 pounds skim milk at 15 cents	11.55
1 calf at 6 months old	100.00
Total value of products	$251.18



JERSEY COW, MACELLA 3RD.

Year's record: milk, 907.47 lbs.; test, 5.74 per cent; fat, 521.2 lbs.; butter, 608.1 lbs. Owned by the University of Wisconsin.

The last cow I shall call your attention to is a Holstein cow, Johanna, bred by our Honorable Chairman, Mr. Gillett. Johanna as a 4-year-old produced 14,856 pounds of milk, testing 3.65 per cent, and 542.4 pounds butter fat, equivalent to 632.7 pounds butter. She has been a regular breeder and we have at the present time three of her progeny in our herd, a heifer calf, a yearling bull, and a two-year-old heifer. We have not priced any of her calves but have refused $300 for the yearling bull. To be conservative, which I think we have been in all cases, we value her calf at the age of 6 months at the same price as the others and credit her as follows:

542.4	pounds fat, at 26.8 cents	$145.26
12627	pounds skim milk at 15 cents per hundred	18.90
1	calf at 6 months old	100.00
	Total value of products	$264.16

HOLSTEIN COW, JOHANNA CLOTHILDE 4TH.

Year's record: milk, 14.856 lbs.; test, 3.65 per cent; fat, 542.4 lbs.; butter, 632.7 lbs. Owned by the University of Wisconsin.

The following tables show the kind, amount, and cost of feed consumed by each cow, the estimated cost of feed for raising the calf to the age of six months and the annual net profit per cow over and above the cost of feed.

Kind, amount, and cost of feed consumed by each of the cows.

	Christina.		Queen.		Macella.		Johanna.	
	Lbs.	Cost.	Lbs.	Cost.	Lbs.	Cost.	Lbs.	Cost.
Mixed hay	1,032	$6 19	939	$5 63	910	$5 46	1,094	$6 56
Alfalfa hay	.....	.....	.....	.....	360	2 52	455	3 19
Silage and soiling	8,028	10 03	6,493	8 12	7,517	9 40	8,351	10 44
Wheat bran	666	8 32	535	6 52	960	12 00	584	10 67
Oats	440	7 35	696	11 64	543	9 07	773	12 90
Corn	532	6 27	179	2 11	105	1 23	139	1 65
Distillers' grains	434	6 51	349	5 03	673	10 10	483	7 25
Oil meal	84	1 26	115	1 73	450	6 75	308	4 62
Gluten feed	.....	.....	173	2 03	224	2 91	390	5 07
Dried beet pulp	.....	.....	.....	.....	214	1 70	270	2 16
Cotton seed meal	.....	.....	.....	.....	33	5 03	11	16
Pasture	.....	5 00	.....	5 00	.....	5 00	.....	5 00
Total cost of feed for cows	.....	$50 93	.....	$47 81	.....	$66 17	.....	$69 67
Cost of feed for calf	.....	15 00	.....	15 00	.....	15 00	.....	15 00
Total cost of feed for cows and calves	.....	$65 93	.....	$62 81	.....	$81 17	.....	$84 67

Annual net profit on production of cows, including their calves, over and above the cost of feed.

	Christina.	Queen.	Macella.	Johanna.
Value of products (milk and calf)	$208 02	$215 68	$251 18	$264 16
Cost of feed (cow and calf)	65 93	62 81	81 17	84 67
Profit (milk and calf)	142 10	152 87	170 01	179 49
Profit (milk alone)	57 10	67 87	85 01	94 49

Such cows as Christina, Queen, Macella, and Johanna, yielding annual net profits of $142.10, $152.87, $170.01, and $179.49 respectively, when credited with their calves, or $57.10, $67.87, $85.01, and $94.49 respectively when their calves are left entirely out of the question, are dairy cows in the true sense of the term and are the class of cows I urge upon every dairyman to have in mind in attempting to breed and rear dairy cows.

Breeding and Rearing.

The terms, breeding and rearing, as they relate to the existence of all forms of life, have a significance attached to their

meaning, which should be better realized. As we study life and think about it, we find it a strange mysterious thing. To think of how life exists in our own peculiar bodies and in the plants and animals about us causes us to ponder over problems and to feel and acknowledge the presence of some great supreme mind and power that controls the universe. Man, however, should feel himself highly honored by being permitted to have power and control over many living things, which exist. Scientific agriculture, which simply means thoughtful agricultural practice, or farming, teaches that man may become responsible for the care of many plants and animals and by working in harmony with nature makes wonderful improvement in their development. To become successful therefore, in breeding and rearing, one must study to know as much as possible about nature and nature's laws. Any violation of nature's laws on man's part is sure to result sooner or later in his defeat. Nature alone can produce the average cow and if left entirely alone, I believe can produce much better cows than many which we see penned up in yards and housed in barns throughout the country—which deprives them from getting the things which nature insists most upon their having,—namely, pure fresh air and water, and plenty of sunlight and exercise. The man who may consider himself the successful breeder by reason of this success in producing cattle of excellent type and performance, as well as the man who ignores and indifferently makes no attempt to improve the animals entrusted to him must bear in mind the power and limitations of nature's laws. All may not be able to succeed with the same degree of success in breeding dairy cows, but practice proves that men are usually successful in proportion to the knowledge which they gain concerning the subject, and to the extent that they religiously apply themselves to putting their knowledge into practice.

Standard of Excellence.

The first essential thing for man to have in mind is a correct standard by which to measure the dairy cow. Our time could more profitably be spent in discussing what should be incor-

porated in a standard for dairy cows. Written standards, commonly called score cards, which refer to the points of size, form, quality and temperament of a cow, have been adopted by various breeders' associations and are taught to students studying the dairy cow. As we apply these score cards to the individual animal they are supposed to indicate the value of the animal as a dairy cow, but men have found that they are apt to be mislead by placing all of their faith in the score card, and for this reason definite standard milk productions for given periods of time have been adopted as a means of providing a more accurate method of measuring the merits of cows. The best breeders of dairy cattle are working for a still broader standard of excellence than any we have written. It is the writer's opinion that dairy cows will soon be measured by written standards, which will call for individual excellence as regards all the points in a score card, a standard production of milk, fat and offspring ancestry noted for long continued service in the production of milk and off-spring, immunity from disease and economy in the utilization of feed. However good a type and however good a producer of milk a cow may be, if she is short lived, and not economical in the use of feed, she is not the kind of cow we can consider as being profitable. Cows capable of consuming feed economically into a considerable quantity of milk for a period of ten, twelve, or more years, and producing annually strong, healthy off-spring, which will develop into animals equally as good as the parents, if not better, are the kind of cows we should like to see bred on every dairy farm in Wisconsin.

Selection of Animals.

Having a well-established standard in mind as regards the ideal cow, one is ready to proceed with the selection of animals with which he can hope to make improvement or at least maintain a standard of excellence which may already have been attained. A pure-bred dairy bull must be selected in every instance, if there is to be any assurance of success. The common native scrub bred bull is responsible for more unprofitable

cows than is the system of feeding practiced on many farms. The scrub bull has one redeeming point to which I am glad to call your attention and one, which I trust you will bear in mind for the sake of your own success and the success of your fellow breeders. I have indicated it on my chart by means of a red star. This is the place to hit him and put him out of existence.

The sire to be used for getting the dairy cow should not only be pure-bred but of distinct dairy breeding. Good beef bulls or bulls from breeds having beef tendencies will not insure the production of dairy cows. The dairy cow is a dairy cow by virtue of her having been selected and bred for many generations for dairy performance. Continued selection and breeding for this purpose has fixed in her a temperament that compels her to be a dairy cow, the same as the German, the Irishman, and the Yankee and men of other distinct types and characters are forced to possess characters peculiar to their respective nationalities.

Select the pure-bred dairy bull, which comes from the best pure-bred cow you can find, as such a bull, it is believed, gives the greatest assurance of producing good daughters. If you have the money to afford it and feel that you cannot make progress otherwise, do not hesitate to pay some of the long prices paid for bulls richly bred. High values placed upon good sires are not fictitious values when one understands the worth of a good sire. The sire should fulfill all the requirements incorporated in the standard of excellence for the cow in so far as full size, character, vigor, health, longevity, prolificacy, and dairy temperament are concerned. These will insure his living to a good old age and proving a most useful dairy sire.

In the selection of cows for the breeding herd, I feel that little can be said at this time for the reason that there is such a scarcity of pure-bred and even high-grade cows in the country. To see so many parties, inquiring for well-bred dairy heifers and cows, unable to find what they want seems discouraging, but the farmer should not be discouraged. The best thing that can be done under existing circumstances is to select the best cows of the herd and mate them with the pure-bred dairy bull and thus make progress in the breeding and improvement of the

herd. In a few generations one can greatly inprove the production of his herd and as pure-bred animals become more numerous, introduce them to take the place of grades and thus reach the highest point of success which may be obtained. The rule to govern the selection of heifers and cows where one is fortunate to find them is found in the true standard of excellence mentioned above, which I trust each will study to have in mind. The cow usually proves the value of the sire, consequently the better the sire, the better the cow. The beginner with his common native herd will have an opportunity for making more marked improvement than will the man who has been in the work of breeding toward a distinct standard for several or more years. The man with the improved herd, however, must be constantly selecting the cows of his herd which promises to improve or at least maintain the excellence he has achieved. In both cases it should be the practice to select and retain the best producers and discard the less desirable animals.

The great power of heredity, or the law that like produces like, is underlying principle which emphasizes the importance of giving the most careful attention to the selection of breeding animals. To attempt to mix breeds or to mix opposite temperaments, such as milk and beef, and to depend upon animals for breeding purposes, which do not possess specific dairy temperaments, will beget disappointment in the way of marked variations, which detract materially from the value of dairy cows as they are put into the herd and milked. There are many mysteries associated with the law of heredity, which only puzzle our minds, unless we enter into a most thorough study of the subject, but we can accept it as the foundation of all successful breeding of plants and animals. The distinct type of our beef producing animals as compared with the equally distinct type of our dairy animals, the distinct size and color markings of our Holstein cows as compared with the distinct size and color of our Jersey cows, and the marked milk producing capacity of our specific dairy breeds as compared with the lack of milk producing capacity in our beef-bred animals is evidence that animals possessing purity of blood and marked dairy temperament will reproduce themselves in their off-spring. With the herd of

good cows, the use of a superior bull insures improvement and profit, and the use of an inferior bull, deterioration, disappointment and loss.

MATING ANIMALS.

The writer is of the opinion that more significance is attached to the matter of mating animals than perhaps any of us appreciate. The ordinary practice of many farmers of allowing bull to run constantly with the herd is not to be recommended. Such practice tends to overtax both cow and bull and create disturbance among the other cows, which is apt to result in serious difficulties. The bull is best cared for in a paddock, provided especially for him. Thus secured he is safe to handle, does not become highly excited and if properly cared for is in the best of condition to give most satisfactory service. It is a serious mistake to allow any bull to be put into service at a young immature age or to allow a mature bull to be overtaxed. It is considered best not to give any bull any service until he is at least fifteen months old and then a limited amount until he reaches his normal size and state of maturity. Properly matured he has an opportunity to prove himself a most useful sire until he reaches an age of twelve, fifteen or more years. The heifer should not be mated until sixteen to twenty months old thus dropping her first calf at the age of twenty-five or thirty months. Some of our best breeders have recommended that the first calf be dropped at the age of thirty to thirty-six monhs, which is undoubtedly better than to have them drop their calves at any age under twenty-four months. Heifers mated to drop their first calves at the age of eighteen or twenty months, which is undoubtedly better than to have them drop tution and made irregular or unreliable breeders for the remainder of their life time.

The offspring of young immature heifers are apt to prove very disappointing, which is not the case if the heifers are allowed to mature to the age of twenty-four months. It is the common belief among many farmers that calves from heifers are less valuable than heifers from cows of mature age. It is

the writer's opinion that there is little difference in the quality and usefulness of a mature heifer's offspring and that of a mature cow. But if the heifers are bred too young we can readily see how the idea has become prevalent that the offspring of heifers are less valuable than that of mature cows. To mate most successfully, both the bull and the cow should be in a healthy, normal, physical and mental condition and handled in a manner to avoid excitement and fatigue so far as possible. In general practice, it is not possible to have all cows freshen in the fall, but it is believed that mating at a time to enable a cow to get the benefit of the summer pasture and plenty of outdoor exercise during her time of gestation, insures a more vigorous offspring than is otherwise produced. The writer has observed that the most prolific cows and those which give the least trouble in mating, are those which produce their offspring annually with a marked degree of regularity. This emphasizes the matter of avoiding, if possible, letting cows run over or pass by their usual time of mating.

REARING THE DAIRY COWS.

The time of mating the cow marks the commencement of rearing her offspring. Breeders are often much disappointed in the offspring, which their cows produce after having given most careful attention to the selection of their cows and bulls. Marked or slight variations cause this disappointment. In many cases these variations are the result of a poorly nourished foetus. The idea may be a theoretical one, but it is a safe rule to follow that if we are to expect our cows to produce a most satisfactory offspring, they must be well cared for and well nourished during their time of pregnancy. Plenty of sunshine, pure fresh air and water and a well balanced ration supplied by the hand of a thoughtful feeder, who counts as much upon the calf as the milk produced, will insure the greatest success. Over-feeding and over-taxing a cow in the production of milk, does not tend to enable her to produce the most satisfactory offspring.

Our barn plans as they exist, will undoubtedly have to be changed in many instances before we can supply all that is necessary to breed and rear the dairy cow successfully. I do not hope to see the day when all shall devote themselves to the breeding and rearing the dairy cow as religiously as it might be desired. I am encouraged, however, to note in different parts of the country improved barns and in them cows which are being cared for by men who are exercising as much pains and thought in their work as it is possible for them to exert. The idea of putting careful thought and one's best efforts into the breeding and rearing of dairy cows is gradually becoming more prevalent and we hope to see the growth of the idea continuing.

To complete my discussion on how to rear a dairy cow, I will briefly give the method employed in raising dairy cows in our University dairy barn, where our results during the past four years have been very satisfactory. It may not coincide with the equally successful methods employed by other dairymen, but it is one which I can conscientiously recommend.

It is aimed to give the pregnant cows of the herd, and others as well, the best of care as regards feed, shelter, and handling. Six weeks prior to calving, cows are carefully dried off in order to give them a rest from producing milk, which is to be recommended in all cases. During this time the grain ration is continued of feeding two to four pounds of oats and bran, the amount depending upon the condition of the cow. It has been observed that this practice gives strength and vigor to the cow and to the calf she produces. The first two to four days, the calf is allowed to run with the cow, after which it receives two to four pounds of whole milk of a low per cent of butter fat three times per day until four weeks old. In some instances, if the young calf is small and inclined to be weak we feed a smaller amount four times per day.

During the fifth week the milk is gradually changed to skim milk. The amount of milk is not increased until about the eighth week, when the calf can be fed eight pounds twice per day. A small amount of grain and dried clover or alfalfa hay is placed before the calf after it is ten days to two weeks old.

The feeding pails, stable and calves are kept as clean as possible and plenty of pure air is provided. Up to last fall the calves were kept on a cement floor. At that time inch boards were laid over the cement floor, which proved to be a great improvement since the results and the comfort of the calves was evident in their coats looking bright and sleek and their showing no indications of suffering with the cold during the coldest days of winter.

A small amount of corn silage is fed after the calf is a month or six weeks old. During the first summer the calves are fed regularly in the barn and turned out for exercise in shady paddocks or during nights only.

Up to twenty-four or thirty months of age, the time the heifer drops her first calf, she does not receive more than four pounds of grain per day. From the time she commences to eat grain, as a calf, she is fed as much as she will relish up to this amount, which with skim milk up to the age of six, eight, or twelve months of age, depending upon the supply of skim milk, corn silage and hay, is sufficient to produce a very satisfactory growth. Our grain mixture for calves consists of a mixture of five parts whole oats, three parts wheat bran, one part corn meal, and one part oil meal. Water and salt are supplied daily, as the calf wants it.

By buying a few pure-bred cows as a foundation for a pure-bred herd, using the best pure-bred bulls and rearing the heifer calves after the manner above described, we have been able to produce cows, which, though young, promise to strengthen our herd and make it a very satisfactory one. I invite you to inspect our University dairy herd, where I feel you can much better comprehend the results we have obtained than it is possible for you to comprehend them from what I am able to say.

I urge upon every dairyman to study, to know his best cows whether they be common native, high grade, or pure-bred, persistently mate them with the best pure-bred dairy bulls, which he can secure, and spare no pains in rearing and developing the offspring. It is the only practice that will insure the successful breeding and rearing of dairy cows.

DISCUSSION.

Mr. Webster: Over in Michigan the Agricultural College is sending out a man to the farmers of the state to get one, two, three or four men to come together and buy a bull and he locates the bull, sees that they get the right sort of an animal. The first week that man was sent out he had 1500 applications to buy a good bull and put it in certain neighborhoods where they never had such a thing before.

Prof. Emery: In some of our neighboring states the law gives larger powers to the commission than it has given in Wisconsin; for instance, Minnesota is one that makes it the legal duty of the Dairy and Food Commission to promote the cause of dairying in the state. We have no such legal function in Wisconsin. Ours is almost exclusively that of police work, so that work that Mr. Webster has referred to as being done in Michigan cannot be done here.

REPORT OF SOME OF THE HERDS TESTED.

H. K. Loomis, Sheboygan Falls, Wis.

It is very hard to get an audience interested in a lot of figures and especially is it hard for me to do so. The only way I see for the average person to get anything out of a report of this kind is to take time after the annual report is published and compare what one herd has done with another and one cow with another. Shall try and be as brief as possible. I shall not attempt to discuss breeding or feeding as those are independent subjects, and so much has been said and written on them by men who are far more competent than I that it would be useless for me to take the valuable time of this convention.

In July 1906 I began a year's test of 12 herds of cows in Sheboygan Co. In selecting these herds I tried to get some of those that I thought the best cared for and some I thought received the least attention. In taking samples from these herds

I went to the farm at night and took sample of each cow's milk and again in the morning took sample putting it in bottle with night's sample. I took samples in this way from each herd once each month during the year. The milk of each cow was weighed when sample was taken and an estimate made at the end of the month of the number pounds milk given by each cow during the month. These samples were all tested by the Babcock test for butter fat and a record kept. Every month during the year a report was made of what each cow had done to the owner of the herds, also a report to the secretary of this association.

In mentioning these herds shall refer to them by number.

Herd No. 1 consisted of thirteen cows, Grade Guernsey, Jersey, Holstein, Shorthorn and two we called Natives.

Average No. pounds milk given by this herd during year 4985.2

Average No. pounds fat given by this herd during year 203.87

Two cows were sold during the year and they are not included in these figures.

No. 1 the best cow in this herd gave during year 7594.3 pounds milk; same cow during year gave 300.8 pounds fat.

Cows fresh from Feb. to middle April and freshened again in spring of 1907. They were milked regularly about 6 o'clock in the evening and about 6.30 in the morning. These cows were well cared for. In August, September and October the weather was very dry and pastures very short. In August and September these cows were fed 4 quarts rye middlings per day. In October corn fodder and 4 quarts rye middlings. During winter they were fed corn fodder, hay and a liberal amount of grain. Water was warmed. The barn is comparatively new. One end of the stable opens on to the barn floor and while the stable was warm the ventilation did not seem bad. The cows looked well. A great deal of care was taken to keep milk clean.

Herd No. 2 consisted of 14 grade Shorthorn and Holstein cows. Two having been sold during the year are not included

in these figures. Thirteen of these cows freshened in March and April, one in July.

Average No. pounds milk for year per cow .....5189.5 pounds
Average No. pounds fat for year per cow ..... 187.7 pounds
No. 1 best cow in herd produced in year .....7511.9 pounds milk
Same cow produced in year ... 247.1 pounds fat

Five cows in this herd ranged from 133 pounds fat to 171 pounds for year. This herd was in fair condition. In July and August they received no feed but pasture. During September and October, in addition to pasture, corn fodder and 2 quarts ground rye and oats per day. In November, mangels were substituted for the grain ration. Balance of winter cows that gave milk were fed the ground rye and oats with corn fodder and hay. The owner of this herd was, I think, the most cleanly and particular about his barn of any farmer I know in Sheboygan Co. The barn is new, stone basement with cement floor and Bidwell stalls. The stable is well lighted by large windows that are kept perfectly clean. As soon as the cows are let into the stable everything on the floor is carefully swept into the gutter. After feeding, the floor in front of the cows is swept clean. In one corner of the stable is a porcelain sink connected by pipe to tank in about the center of the basement on north side. This tank is raised so it stands just below the ceiling. Water is pumped into this tank by a wind mill. There is a pipe running from the sink down through the cement floor then to the gutter so the gutter can be flushed out at any time. There are always plenty of clean towels on shelf over this sink and each milker washes his hands before milking. The cows are brushed and cleaned thoroughly before milking and it seems as though every detail was looked after that could be to keep the milk clean and pure. Yet one very important thing was overlooked when this barn was built, and that was ventilation. This farmer had never heard of the King system of ventilation.

HERD NO. 3.

Consisted of 31 cows. This herd was picked up where ever the owner could get them. Many of them were bought at auctions. They are a mixed lot of grade Holsteins, Shorthorns and Natives. Eight of the herd were sold during the year and one died, leaving only twenty-two cows included in the following figures:

Average No. pounds milk given during year, 5215.5 pounds; average No. pounds fat given during year, 192.3 pounds.

Cow No. 24 best in herd gave during year 7767 pounds milk; same cow gave during year 262.3 pounds fat.

The owner of this herd of cows saw by the reports I made each month that he had a lot of cows that were not paying for the feed they consumed so he began selling until he had disposed of eight. He now thinks a Testing Association would be a good thing and is willing to go in with his neighbors and pay his share of the expense. The testing of his cows started him thinking. He now has a registered sire and has bought several pure bred heifers. This farmer has a very expensive new barn. When building it three years ago I talked with him about ventilation. He told me he had that planned. After the barn was finished he one day asked me to ride over to his farm and see the new barn. I did so and was very much surprised to see what he called his ventilation system. The barn is one hundred feet long by fifty feet wide, stone basement eight feet from floor to ceiling. He keeps in this stable four horses, thirty head of cows and a number of young animals. His system of ventilation for all this stock was a four-inch tile laid at the top of the wall, one tile at each corner of the barn. In the winter when the stock was stabled this man found his ventilation was of no account. When the door of the barn was opened in the morning the steam rushed out so that it looked as though the barn was on fire. Everything inside was damp and the ceiling dripping. Mr. Aderhold, state inspector, came to the place about this time and I called his attention to this barn. He went to see it and explained to the owner the King system. He immediately put in four ventilators. There was a great im-

provement but he did not put in as many ventilators as he ought. This herd received no feed but pasture until September, then they received corn fodder. After November 1st a liberal amount of grain, corn fodder, ensilage and hay was fed through the winter.

HERD NO. 4.

Consisted of 13 cows. This man sold his farm in December. The cows were sold at auction and scattered so it was impossible to keep up the test.

HERD NO. 5.

Consisted of 40 cows. On my second visit the owner of the herd had lost all trace of the numbers given the cows and I was obliged to give up the test of this herd.

HERD NO. 6.

Consisted of 25 cows ten of which were sold during the year. The following figures applied only to the 15 cows tested for the full year.

Average No. pounds milk per head during year, 5302.9 pounds; average No. pounds fat per head during year, 203.48 pounds.

Cow No. 6 of this herd gave during the year, 8130.9 pounds milk; same cow gave during the year, 260.51 pounds fat.

Cow No. 5 of this herd gave during the year, 6636.4 pounds milk; same cow gave during the year, 299.95 pounds fat or in other words Cow No. 6 gave 1495.5 pounds more milk than Cow No. 5, and gave 39.44 pounds more fat than No. 6.

This herd of cows was fed green oats during July and a part of August, then corn fodder until December when a liberal amount of grain was added. The cows drank from tank supplied by well. Can't say that the ten cows sold were really culled. The owner divided his farm and rented a part to his son and the balance to his son-in-law and the son-in-law bought the ten head. The barn where these cows were kept was an old

one, basement stable, very poorly lighted and practically no ventilation except what air came in round the doors and through the cracks.

HERD NO. 7.

Consisted of 14 cows. Grade Jerseys, Holsteins and Shorthorns. Two cows were sold during the test so the following figures only refer to twelve cows.

Average No. pounds milk per head during year, 5724.5 pounds; average No. pounds fat per head during year, 202.5 pounds.

No. 10 best cow in herd gave during year 7359.2 pounds milk; same cow gave during year 268.6 pounds fat.

This herd was fed hay and corn fodder from July to middle of following May. In March after cows began to freshen they were fed corn ground with cob, ground oats and bran. Cows drank from tank supplied by well.

HERD NO. 8.

Consisted of 17 cows grade Holsteins and Natives.

Average No. pounds milk per head for year 4716.8 pounds; average No. pounds fat per head for year 168.39 pounds.

No. 14 best cow in herd gave for year 6366.5 pounds milk; same cow gave for year 229.70 pounds fat.

No. 4 poorest cow in herd gave for year 2735.5 pounds milk; same cow gave for year 91.12 pounds fat.

This herd received no feed except pasture until middle of August and from that time until March they were fed on corn fodder and hay. In March owner began feeding corn ground with cob and bran, the mixture being one hundred pounds corn and one hundred pounds bran. These cows were driven about half a mile once daily during winter to river for water. Here was a herd of cows I think naturally as good as herd No. 7 but from lack of feed and the manner of watering them caused each cow to give on an average of over one thousand pounds of milk less

during the year than herd No. 7 and 34 pounds per head less fat. The barn was old and very poorly lighted with no ventilation except through an opening on the barn floor.

HERD 9.

Consisted of 20 cows all grade Holstein. This farm had been rented. An undivided half of the cows belonged to each the owner of the farm and the tenant. October 1st the tenant's lease expired, he having bought a farm near by moved his share of the cows on to his farm and I was able to keep up the test of the whole herd. In the division of the cows it seems the tenant only got nine out of the twenty head. Up to October 1st when the lease expired these cows had received no feed but pasture. After October 1st the tenant began feeding his cows corn fodder and a small grain ration increasing it gradually until the cows had a fairly good feed. These cows were watered from a well.

Average No. pounds milk given by 9 cows during year 6874.9; average No. pounds fat given by 9 cows during year 249.32.

Cow. No. 19, best of the nine head taken by tenant, gave during year 8960.8 pounds milk; same cow gave during year 330.56 pounds fat.

The eleven cows taken by the man who owned the farm were fed corn fodder and hay through the winter. In March as they began to freshen they were given a light grain ration. These cows were driven to the river for water during the winter.

Average No. pounds milk given by the 11 cows left on farm for the year, 4982.1; average No. pounds fat given by the 11 cows left on farm for the year, 180.73; making a difference of 1892.8 pounds milk in the average of the two lots of cows and difference in the average pounds of fat of 68.91 pounds. This is in favor of the cows taken by the tenant. In other words the nine cows taken by the tenant and properly fed and cared for after October 1st gave during the year 17071 pounds milk more than the eleven left on the farm. The barn on this farm is an old one with stone basement. Should think it about 60x40

with seven windows, each having 8x10 lights of glass. On the west side of the barn the straw was stacked covering up two of these windows.

President Gillett: Before we adjourn at this, the conclusion of our program for this meeting and also our sessions of the Thirty-sixth Annual Convention of the Wisconsin Dairymen's Association, on behalf of the Wisconsin Dairymen's Association and its members, I wish to tender the thanks of this Association to the people of Monroe for the reception they have given us in their city. If perchance through these sessions we have dropped a thought or two that may help any among you as dairymen in this community, our efforts will not have been in vain.

Again thanking you for your attention and consideration, as well as your hospitality during our stay here we will adjourn sine die.

FINANCIAL STATEMENT.

Mr. President and Members of the Association:

The following itemized report is made showing the source from which all moneys paid into the Treasurer's hands were received and the disbursements paid on orders from the Secretary which I hold as vouchers.

H. K. LOOMIS,
Treasurer.

Receipts.

March 6.	Balance in hands of treasurer	$8 12		
	Membership for 1907	202 00		
March 1.	From state treasurer	1,000 00		
May 18.	From state treasurer	2,000 00		
Nov. 30.	From state treasurer	1,000 00		
1908.				
Feb. 27.	From state treasurer	1,000 00		
				$5,210 12

Disbursements.

March 6.	Hotel bills of speakers at Tomah convention	$49 59	
	H. K. Loomis, expense at Tomah convention	15 36	
	Chas. L. Hill, expense at Tomah convention	11 54	
	H. K. Loomis, cash advanced T. L. Haecker	75 00	
	E. B. Vorhees, honorarium and expense Tomah convention	178 84	
	H. D. Griswold, expense Tomah convention	4 65	
	C. P. Goodrich, expense Tomah convention	8 72	
	H. C. Searles, inspector and expense Tomah convention	115 31	
March 9.	H. K. Loomis, inspector for February	45 64	
	Frank B. Fargo, expense Tomah convention	11 96	
	Geo. W. Burchard, expense Tomah convention	8 74	
March 13.	F. W. North, premium on milk and cream	14 00	

March 13.	R. B. Robertson, premium on milk and cream	16 00	
	W. H. Schneider, premium on milk and cream	4 00	
	Wm. Brennan, premium on milk and cream	8 00	
	C. C. Hill, premium on cream	4 00	
	Elmer Hill, premium on cream	2 00	
	H. C. Taylor, expense Waukesha and Tomah convention	18 87	
March 21.	W. J. Gillett, expense 1906	7 16	
	Mrs. A. L. Kelly, reporter	114 29	
Apr. 9.	H. C. Searles, inspector	109 20	
	H. K. Loomis, inspector	50 00	
Apr. 25.	Chas. L. Hill, expense attending executive board meeting	5 08	
	W. J. Gillett, expense attending executive board meeting	5 08	
	H. K. Loomis, expense attending executive board meeting	7 28	
	C. H. Everett, expense attending executive board meeting	6 80	
	A. D. DeLand, expense attending convention Tomah	13 36	
May 8.	H. C. Searles, inspector	119 80	
	H. K. Loomis, inspector	50 64	
	Peter Zumkehr, inspector	98 00	
June 11.	Peter Zumkehr, inspector	135 00	
	H. K. Loomis, inspector	50 00	
	H. C. Searles, inspector	150 30	
July 11.	Peter Zumkehr, inspector	125 00	
	H. C. Searles, inspector	158 70	
	H. K. Loomis, inspector	50 35	
Aug. 7.	H. C. Searles, inspector	160 85	
	Peter Zumkehr, inspector	131 75	
Sept. 11.	Peter Zumkehr, inspector	135 00	
	H. C. Searles, inspector	168 18	
Oct. 11.	H. C. Searles, inspector	157 53	
	Peter Zumkehr, inspector	125 00	
Nov. 7.	Peter Zumkehr, inspector	130 00	
	H. C. Searles inspector	138 95	
Dec. 3.	Thomas Luchsinger, printing report S. W. S. Association	75 00	
Dec. 11.	Peter Zumkehr, inspector	115 00	
	H. C. Searles, inspector	160 78	
1908.			
Jan. 15.	H. C. Searles, inspector	151 75	
Feb. 6.	H. C. Searles, inspector	157 65	
	Peter Zumkehr, inspector	115 00	
Feb. 12.	E. E. Wyatt, taking cow census	30 00	
March 4.	H. C. Searles, inspector	145 55	
	Peter Zumkehr, inspector	120 00	
March 17.	W. D. Hoard Co., printing	30 80	
	Geo. W. Burchard	315 30	
	Balance in hands treasurer	797 77	
			$5,210 12

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STATE FISH HATCHERY, DELAFIELD.

BIENNIAL REPORT

OF THE

Commissioners of Fisheries

OF WISCONSIN

For the Years 1907 and 1908.

MADISON, WIS.
DEMOCRAT PRINTING CO., STATE PRINTER.
1908.

COMMISSIONERS.

THE GOVERNOR, ex-officio.

CALVERT SPENSLEY, President ..... Mineral Point

JAS. J. HOGAN, Vice-President ..... La Crosse

EDWARD A. BIRGE, Secretary ..... Madison

WILLIAM J. STARR ..... Eau Claire

HENRY D. SMITH ..... Appleton

JABE ALFORD ..... Madison

A. A. DYE ..... Madison

JAS. NEVIN, Superintendent of Fisheries ..... Madison

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LETTER OF TRANSMITTAL.

To the Honorable the Legislature of Wisconsin.

In compliance with the law, the Commissioners of Fisheries submit herewith, a report on their transactions for the years 1907 and 1908.

COMMISSIONERS' REPORT.

The report of Superintendent Nevin, submitted herewith, gives the important facts regarding the work of the Commissioners of Fisheries during the past two years. The usual varieties of fish have been propagated in our hatcheries and distributed. In addition the Commissioners have received from the United States Bureau of Fisheries 50,000 grayling eggs, and 50,000 eggs of the steel-head trout. These have been planted in our waters, and the results of the experiment will be watched with interest. They have also received from the same source 14,500,000 lake trout eggs and 40,000,000 whitefish eggs, which they gratefully acknowledge. The whitefish eggs received from the government are of especial importance to us, since we have been unable to secure any considerable number of whitefish eggs from our own waters.

The last biennial report of the Commissioners recorded their purchase of property at Delafield for a bass hatchery. During the period covered by this report this property has been fenced, ponds have been constructed, and an excellent hatchery building has been erected and equipped.

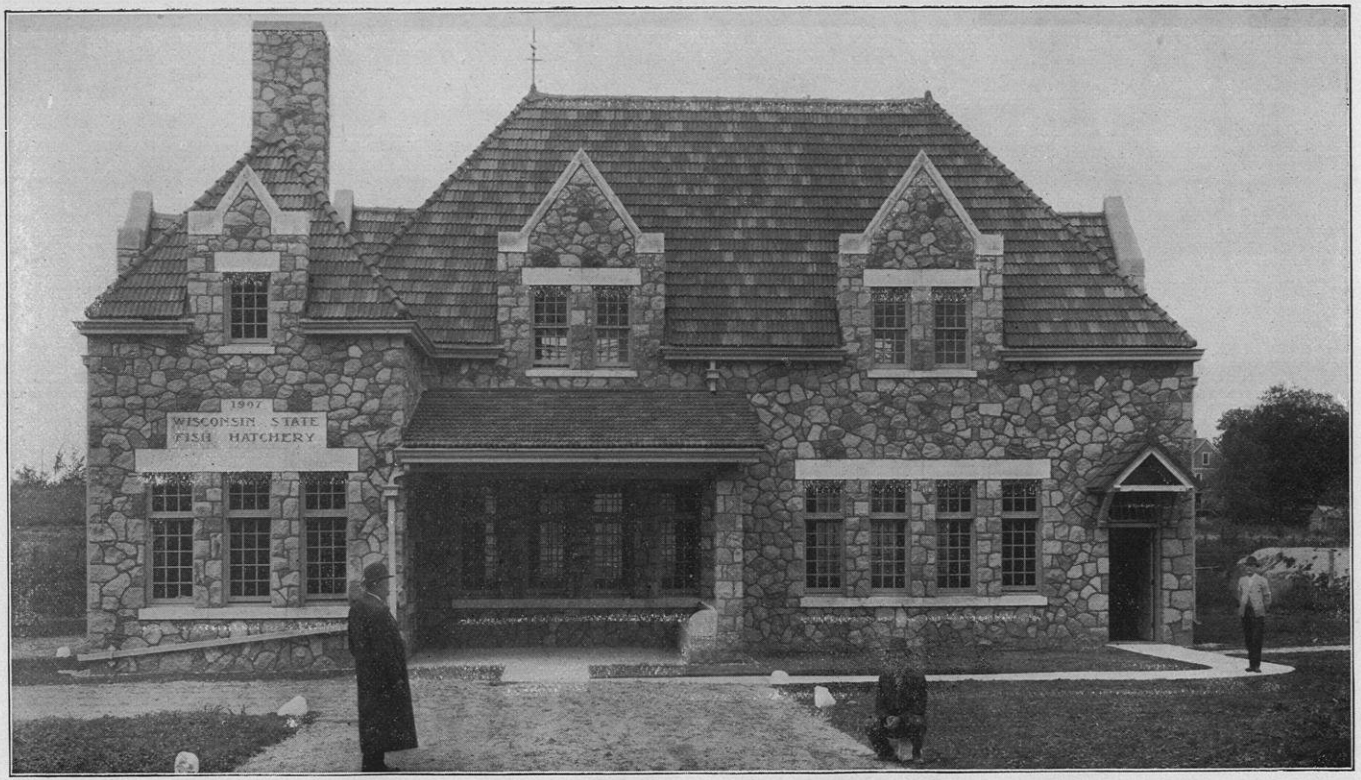
Acting under authority from the legislature of 1907, the Commissioners purchased in 1908 fifty-nine acres of land at Wild Rose, Waushara County, for the establishment of a new trout hatchery. The grounds have been fenced and several ponds have been built. These have been lined with stone, provided with concrete bulkheads, and in general constructed in the most substantial manner. The work of raising and distributing fish from this hatchery has not been begun, but the Commissioners believe it will be possible to secure large results there. The situation seems almost ideal for the construction of ponds for rearing fry, as well as of ponds for the containing of breeders. The

supply of water from springs is large and apparently unfailing. The Commissioners also control the main stream, and have a large area of land on which ponds can be constructed, capable of holding many thousands of breeders. Other matters relating to the work of the several hatcheries are referred to in the report of the superintendent.

The Commissioners desire to make special mention of the faithfulness and ability with which all of their employes have performed their duties. Success in the work of propagating and distributing fish can be reached only if those who are in immediate charge of the work give their best thought and effort to it. The Commissioners are glad to say that their employes are eager in every way to serve those interests of the state which are committed to them.

During the past year the question of the conservation of our natural resources has come prominently before the minds of the people. Less, perhaps, has been said regarding the conservation of our resources of fish than regarding other matters, although this is one of the most important of our natural resources both as regards food and recreation. There was less need for discussion of the subject since the importance of this resource and the necessity for its careful conservation have been well known for many years. But the increasing attention given to the general subject has not been without its effect on this part of it. Much progress has been made during the biennial period, both in solving problems of protective legislation and those concerned with the propagation of fish.

During the biennial period important movements have been made, looking toward better legislation for the protection of commercial fisheries, especially those of the Great Lakes. An agreement was recently concluded between the governments of the United States and Great Britain, in accordance with which joint fishery regulations are to be arranged and enforced in the waters whose possession is divided between Canada and the United States. In accordance with this agreement, the control of fishing in these waters will rest in the federal government and in that of Canada, which will agree upon common regulations.



STATE FISH HATCHERY, DELAFIELD, WIS.

Commissioners' Report.

During the past year a joint commission has been engaged in investigating the waters along the international boundary, and it is expected that the regulations recommended for the several districts will be reported before the close of the calendar year. When these regulations go into force, the control of fisheries in boundary waters, like those of Lake Superior and the other Great Lakes between the United States and Canada, will be in the hands of the federal government. The advantages of this method of regulating our fisheries is obvious. It substitutes uniform methods of control for the varying, and often conflicting, laws of the several states and the provinces of Canada. The diversity of such regulations was of comparatively small importance so long as the fisheries were matters of local interest only. With the introduction of methods of cold storage and of transportation, the market reached by the fisherman has been greatly enlarged, and the fisheries of the Great Lakes have passed from a matter of local interest to one that is of general concern to the country. The increasing demand for fish, with the correspondingly increased efficiency and extent of the methods for capturing them, has brought about a situation in the lake fisheries which has for some time imperatively demanded their uniform regulation.

It is obvious that the legislative problems offered by the fisheries of Lake Michigan are essentially the same as are found in the fisheries of the Great Lakes which form part of the international boundary. The control of these fisheries should also be with the federal government, and it is hoped that the states bordering Lake Michigan will, as promptly as possible, cede to the federal government the right to regulate the fisheries of that lake on the same principles as it does those of the other Great Lakes.

It would be very advantageous if this federal control could be extended to other interstate waters on the boundaries of Wisconsin, and especially to the fisheries of the Mississippi river. These fisheries are increasing in importance, as is shown by the report of the superintendent. The small extent of the waters makes it especially desirable that the control of fishing should be uniform, and that there should be no divergent legislation on the part of the states which bound the Mississippi. It is also obvious that,

if the fisheries of this river are to develop and are to increase as they should do, and if the Mississippi river is to yield to the people the amount of food which it is easily capable of producing, it will be necessary to resort to artificial propagation of fish for that river. It is not yet certain whether this will be done by means of hatcheries, or by collecting and replacing in the river, on a large scale, the fry which, during the summer, become caught in shallows and back waters. In all probability both methods will be used, and that on a very extensive scale. While the states bordering the Mississippi are carrying on the work of maintaining the river fisheries, it will be difficult to secure such concurrent and extensive action on their part as is necessary for the complete utilization of the stream for commercial fishing. It will be, in the long run, advantageous for the federal government ultimately to assume both the control and the maintenance of commercial fisheries in interstate waters. At present, however, such control is not practicable, and the State should continue its work on the present scale, and indeed on a much larger scale than is possible at present. Not only should the fisheries of the river be maintained, but a large number of game fish can profitably be transported to inland waters. The Commissioners endorse Superintendent Nevin's recommendation for an appropriation for increased work on the Mississippi river.

During September of the current year the Fourth International Fisheries Congress was held at Washington, attended by many persons from the United States who are interested or engaged in the propagation of fish, and by delegates from many foreign nations. This congress was by far the largest which has yet been held, and the increased interest evidenced by this fact is only one sign of the growing value to the public of the work of breeding fish. Commissioners Alford, Birge, and Starr, with Superintendent Nevin, attended this congress. Among the subjects which were discussed at the congress none exceeded in interest that of the best methods of maintaining and restoring the catch of whitefish in the GreatLakes. A prize had been offered for the best paper on this subject, for which three papers were entered, from Mr. Paul Reighard of the University of Michigan, and

from Messrs. Frank Clark, of the United States fisheries station at Northville, Michigan, and S. W. Downing of the station at Put-In-Bay, Ohio. All of these writers, who are experts in the matter, agreed that the best legislation for the development of the whitefish industry would be that which permitted fishing during the spawning season, *provided,* the states made arrangements by which all of the whitefish thus caught should be spawned, the eggs hatched, and the fry planted in the lakes. The general opinion of the Congress agreed with the conclusion thus reached independently by three experts. The same principle would apply to the regulation of the lake trout fisheries. It should be clearly understood as the unanimous opinion of the congress that fishing during the spawning season should be permitted only where the fullest and most complete arrangements had been made for the preservation and hatching of spawn, and that fishing during the spawning season under any other conditions was in the highest degree hostile to the permanent interests of the fisheries. On this matter of legislation, however, the Commissioners do not expect to make recommendations for any fundamental changes in our laws, thinking it wiser that Wisconsin, with the other states bordering Lake Michigan, should entrust the regulation of these fisheries to the federal government. They call attention, however, to the statements made in the report of Superintendent Nevin, regarding the use of small-meshed nets in the Great Lakes and their effect upon the fish which the Commissioners are planting there. It is obviously useless to expect any great improvement of these fisheries so long as the fishermen are allowed to catch the fish which the Commissioners plant, while these are still immature and unable to propagate, and at an age when they still have very little market value. No more shortsighted policy is imaginable, for the interests of the fishermen, than is the use of these small-meshed nets.

In the long run the interests of the public and the commercial fishermen are identical. That policy is best for both which will secure the maximum permanent supply of food fish. It is always possible, by means of small-meshed nets and over-fishing, to secure a larger amount in a single year or in a few years than

the fish can replace; but while this practice may lead to increased profits for a year or two, it is certain to be followed by ultimate loss. The waters will yield a certain crop of fish, as the land may of corn, and no more should be removed every year than the water can annually produce. Wise, protective legislation is, therefore, demanded, equally in the interests of the fishermen and in those of the public which depends on the waters for so important an item of food.

It is becoming increasingly plain that the natural increase of fish is by no means sufficient to maintain commercial fisheries, either in lakes or rivers, on the scale which these fisheries have now reached. The demand for fish is great and increasing. The loss to the species, by lack of fertilization of eggs and by the destruction of spawn and young fry, is so great that the fisheries cannot be maintained by natural methods. It is also becoming plain that, by the planting of fry on a great scale, but on one which is by no means impossible, the fisheries can not only be maintained but very considerably increased. If, however, the fisheries of the Great Lakes are to be thus maintained, fry must be planted, not by millions, as we have been doing, but by hundreds and even thousands of millions. The experience of the federal government with the salmon fisheries of the Sacramento river, California, is a case in point. The salmon are now unable to reach the former spawning beds in the upper waters of this river, and the entire fisheries of this stream amounting to over $200,000 annually, depend on artificial propagation. For a considerable number of years the United States government has been planting an average number of about 70,000,000 salmon fry in this stream, and this has been found sufficient to maintain the fisheries, and to bring about some increase. If the number of fry thus planted and the extent of the waters are compared with the number of lake trout or whitefish fry which are planted in our Great Lakes, and with the area of these lakes, it will be readily appreciated that, great and successful as is the work which has been done by the Commissioners of Fisheries of the several states, their task has only commenced. Not only can the fisheries of the Great Lakes be maintained but they can also be greatly

increased; but to do this will demand the collection of spawn and the planting of fry on a scale many times greater than has yet been attempted, except in the case of whitefish on Lake Erie by the United States Bureau of Fisheries.

Another problem in which the fish experts have reached a practical agreement is that of the methods necessary for the protection of the game fish, in our inland waters, especially those which spawn on nests. For these fisheries of the smaller inland waters the methods of control are essentially different from those of the commercial fisheries of the Great Lakes. While these inland waters have a local importance as yielding food, their value as a means of sport and recreation is much greater, both to the state and to the community in which the lake is situated. For this reason, the aim of legislation for many years has been to preserve the fishing rather than to cause the lakes to yield a maximum amount of food. The use of nets, seines, and similar means of catching fish is forbidden and the sale on the market of game fish is prohibited. The black bass is preeminently the game fish of our inland lakes, and it is of great importance that the supply of these fish in these lakes should be maintained and increased. The Wisconsin Commissioners of Fisheries are hatching and distributing a considerable number of bass fry, and are also distributing fingerlings which they rescue from the drying sloughs and bottoms of the Mississippi river. Unlike trout, the black bass cannot be artificially spawned and the eggs hatched in trays in enormous numbers, and the fry brought up to the age when they can be distributed. Each pair of bass must have its nest, and this fact involves the maintenance of ponds very large in proportion to the number of fry which can be produced from them. Thus the number of bass fry which a hatchery can produce is much smaller for an equal area of ponds than is that of trout. On the other hand, the bass, under natural conditions, hatch out and raise a much larger proportion of their eggs than do trout. It follows that the State should and must depend for the maintenance of this fish primarily on its natural propagation, and should regard artificial propagation only as a means of supplementing natural. Since the

bass guard their nests and the young until the latter are able to take care of themselves, the fish is one which profits most largely by proper legal protection during the spawning season. In most of our states, and Wisconsin is no exception to the rule, the season for bass fishing begins so early that few fish have completed the duties of rearing the young, and the opening of the fishing season witnesses the destruction not only of a large number of adult fish in river and lake, but with this the death of many millions of spawn or newly hatched fry whose existence is necessary to the maintenance of the species. Bass should be protected by permitting fishing during a limited open season, and forbidding it at all other times of the year, rather than by the reverse process which is now in use. The open season should not begin before the date when the spawning of the fish and the rearing of the young are fully completed. If such legislation could be enacted *and enforced,* it would not be difficult for the State to rear enough bass fry in its hatcheries to supply any natural deficiency; but if the catching of bass during the breeding season is to be permitted, it will practically impossible for the State to maintain the supply of these fish by artificial propagation.

The propagation of fish on a large scale and the distribution of fry to the various waters of the country is a matter of recent development, and one which experience has shown to be not only useful but indispensable in maintaining and increasing the supply of fish and the industries which depend upon them. It is equally indispensable for the maintenance of the stock of game fish both in streams and lakes. Experience has also shown that the success of these efforts is certain if they are intelligently directed and properly supported by protective legislation. This statement needs no proof in Wisconsin where there are now hundreds of miles of the best trout streams in which no trout existed before the Commissioners began to plant fry in them. Many problems have been encountered in the prosecution of this work; many experiments have been tried, a large proportion of which have necessarily been failures. But out of these failures has come knowledge which has brought success. While there still remain very numerous problems to be solved, the Commission-

ers feel that the great lines of action are now marked out, both as regards legislative control and the maintenance of the fisheries by artificial propagation. The problems of the commercial fisheries, are quite different from those of the inland fisheries, mainly valuable for sport. In both cases, however, the principles of legislation are similar, though the application may be very different. An intelligent, uniform, and vigorously enforced policy is necessary, which will lead to the maximum protection of the interests, both of the fishermen and of the public. The preservation and increase of the commercial fisheries will depend in large part on wise legislation, and also, in great measure, upon the hatching and planting of enormous numbers of fry. The maintenance of the inland fisheries, especially those of the lakes, will depend primarily upon the intelligent limitation of fishing, together with such additions to the natural supply of fry as will maintain the various species of fish in full numbers.

CALVERT SPENSLEY,
JAS. J. HOGAN,
E. A. BIRGE,
WILLIAM J. STARR,
HENRY D. SMITH,
JABE ALFORD,
A. A. DYE,
Commissioners of Fisheries.

Financial Report.

FINANCIAL REPORT.

STATEMENT FOR YEAR ENDING JUNE 30, 1907.

RECEIPTS.

1906			
July 1.	To balance on hand	$3,898 68	
July 8.	To annual appropriations	30,000 00	
July 13.	To J. J. Hogan, treasurer	10 38	
Oct. 1.	To appropriation for Minocqua building, Ch. 465, Ls. 1905.	5,000 00	
Nov. 1.	To appropriation for trout hatchery, Ch. 484, Ls. 1905	5,000 00	
			$43,909 06

DISBURSEMENTS.

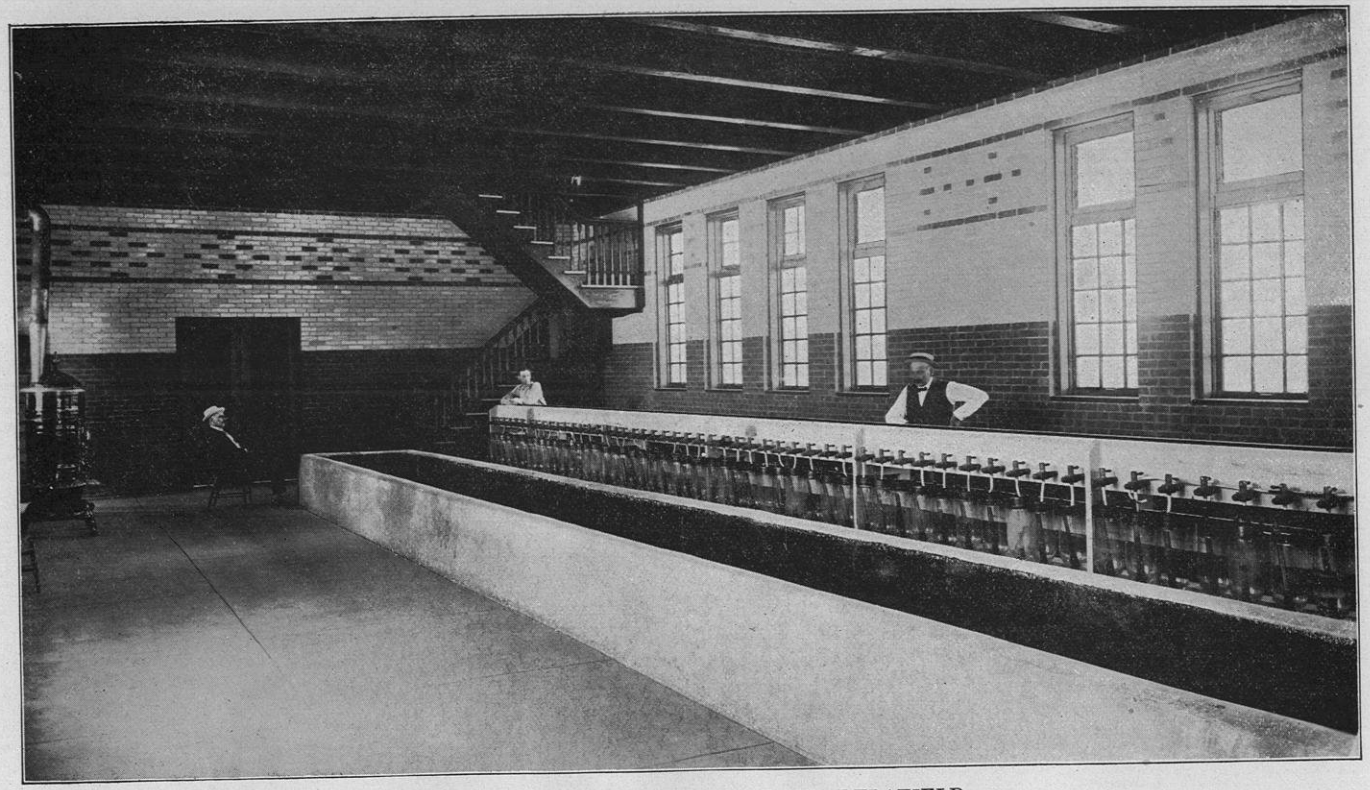
1907.			
June 30.	Salary, James Nevin, Supt. 12 months	$2,000 00	
	Salary, Arthur Sykes, clerk, 12 months	1,200 00	
	Salary, Willmot Nevin, clerk, 3 months 13 days	180 42	
	Salary, Matt Patterson, clerk, 4 months 11 days	219 66	
			$3,600 07

MADISON HATCHERY.

Salary, Valentine Maag, foreman, 12 months	$900 00	
Salary, James Foy, 12 months	600 00	
Salary, Albert Gallagher, 6 months	360 00	
Salary, Frank C. Ramsdale, 4 months	240 00	
Sundry employment	92 96	
Fish food	662 62	
Supplies for barn	156 90	
Supplies and equipment	278 85	
Permanent improvements	42 26	
Trout eggs purchased	205 00	
		$3,538 59

BAYFIELD HATCHERY.

Salary, Henry Sykes, foreman, 9 months	$740 00	
Salary, Frank C. Ramsdale, 7 months	420 00	
Salary, Bernard Holtman, 12 months	600 00	
Salary, Andrew Wahlquist, 12 months	540 00	
Salary, Hugo Dufva, 1 month	50 00	
Salary, John Hagberg, 9 months	405 00	
Sundry employment	171 12	
Fish food	760 91	
Supplies for barn	167 71	
Permanent improvements	1,451 00	
Supplies and equipment	295 13	
Collecting lake trout spawn	265 95	
Trout eggs purchased	150 00	
Miscellaneous expenditures	11 30	
		$6,032 12



INTERIOR OF HATCHERY BUILDING, DELAFIELD.

Financial Report.

OSHKOSH HATCHERY.

Salary, John Maag, 12 months	$960 00	
Salary, Hugo Dufva, 7 months	350 00	
Salary, William Haslem, 3 months	225 00	
Sundry employment	78 13	
Water rents	457 73	
Supplies and equipment	247 93	
Collecting lake trout eggs	45 67	
Collecting whitefish eggs	298 35	
Collecting wall-eyed pike eggs	926 91	
		$3,589 72

MINOCQUA HATCHERY.

Salary, Robert Ripple, 12 months	$900 00	
Sundry employment	594 08	
Supplies and equipment	73 69	
Supplies for barn	101 04	
Permanent improvements	968 45	
Hatchery building	5,000 00	
Collecting black bass breeders	353 17	
Collecting wall-eyed pike spawn	492 29	
		$8,482 72

DELAFIELD HATCHERY.

Salary, Henry Sykes, foreman, 3 months	$300 00	
Salary, Albert Gallagher, foreman, 5 months	350 00	
Salary, Hugo Dufva, 3 months	120 00	
Salary, John Hagberg, 3 mos	120 00	
Sundry employment	50 00	
Permanent improvements	4,910 80	
Supplies and equipment	213 44	
Collecting black bass breeders	48 05	
		$6,112 29

DOUSMAN POND.

Salary, Geo. D. Phinney, 12 months	$240 00	
Rent of pond	137 49	
Supplies and equipment	84 58	
Black bass breeders	124 90	
Miscellaneous expenses	1 70	
		$588 67
Preliminary expenses locating trout hatchery		$206 17
Expenses, James Nevin, Supt., 12 months		457 05
Transportation and distributing fish		4,729 18
Reparing and maintaining distributing car		823 97
Premium, State Insurance Fund		101 25
Gathering pickerel spawn		110 99
Collecting and distributing black bass, Mississippi river		254 58
Collecting and distributing white bass		7 52
Collecting specimens, economic fishes		74 27
Miscellaneous expenditures		198 35
Total expenditures, 12 months		$38,907 61
Lapsed into hunting license fund account Delafield Hatchery appropriation, Ch. 484, Ls. 1905		08
Balance on hand		5,001 37
		$43,909 06

Financial Report.

STATEMENT FOR YEAR ENDING JUNE 30, 1908.

RECEIPTS.

1907			
July 1.	Balance on hand	$5,001 37	
	Annual appropriations	30,000 00	
	Special appropriation, Sec. 1496a, laws 1907	25,000 00	
Oct. 10.	Refund by Wm. Haslem	15 00	
Dec. 21.	Bayfield Mill Co. for trespass	75 00	
			$60,091 37

DISBURSEMENTS.

1908.			
June 30.	Jas. Nevin, superintendent, salary, 12 months	$2,500 00	
	Arthur Sykes, clerk, salary, 12 months	1,500 00	
	Matt. Patterson, clerk, salary, 12 months	600 00	
			$4,600 00

MADISON HATCHERY.

Valentine Maag, foreman, salary, 12 months	$900 00	
Jas. Foy, salary, 4 months	200 00	
F. C. Ramsdale, salary, 12 months	720 00	
Francis Brissee, salary, 5½ months	267 67	
Frank Meade, salary, 3 months	150 00	
Sundry employment	231 39	
Fish food	901 51	
Supplies for barn	217 10	
Supplies and equipment	216 66	
Permanent improvements	450 31	
Trout eggs purchased	250 00	
		$4,503 64

BAYFIELD HATCHERY.

Philip Zalsman, foreman, salary, 10 months	$850 00	
Bernard Holtman, salary, 12 months	700 00	
Henry Sykes, salary, 5 months	400 00	
Andrew Wahlquist, salary, 12 months	590 00	
Fred Wahlquist, salary, 10 months	450 00	
Horace W. Zalsman, salary, 5½ months	205 16	
Hugo Dufva, salary, 2 months	100 00	
Sundry employment	380 33	
Fish food	1,059 93	
Supplies for barn	175 40	
Supplies, repairs and equipment	656 26	
Permanent improvements	102 10	
Collecting lake trout spawn	264 50	
Trout eggs purchased	250 00	
Filling ice house	79 50	
Miscellaneous expenditures	16 00	
		$6,279 18

OSHKOSH HATCHERY.

John Maag, foreman, salary, 10 months	$900 00	
James Foy, salary, 6 months	315 00	
Sundry employment	70 50	
Rent of water	593 13	
Supplies, repairs and equipment	256 12	
Collecting lake trout eggs	198 51	
Collecting wall-eyed pike eggs	727 71	
		$3,060 97

Financial Report.

MINOCQUA HATCHERY.

Robt. Ripple, foreman, salary, 12 months	$960 00	
Sundry employment	289 00	
Fish food	47 94	
Supplies and equipment	631 35	
Supplies for barn	108 37	
Permanent improvements	285 00	
Additional land purchased	3,211 15	
Collecting black bass breeders	345 82	
Collecting pike spawn	393 30	
Miscellaneous expenditures	77 55	
		$6,299 48

DELAFIELD HATCHERY.

Albert Gallagher, foreman, salary, 12 months	$1,020 00	
Sundry employment	421 15	
Hatchery building	9,043 58	
Other permanent improvements	4,758 65	
Supplies and equipment	311 86	
Collecting black bass breeders	109 40	
Fish food	40 00	
Collecting wall-eyed pike eggs	475 77	
Miscellaneous expenditures	14 80	
		$16,195 21

WILD ROSE HATCHERY.

Preliminary expenses, locating hatchery	$106 11	
Real estate purchased	3,549 61	
Permanent improvements	3,137 42	
Supplies and equipment	95 85	
		$6,888 99

DOUSMAN POND.

Geo. D. Phinney, salary, 3 months	$60 00	
Rent of pond, 3 months	37 50	
Sundry employment	78 60	
Supplies and equipment	13 44	
		$189 54

Expenses, Jas. Nevin, superintendent, 12 months	$468 87
Transportation and distributing fish	$6,273 04
Repairing and maintaining distributing car	803 77
Premium, state insurance fund	117 45
Collecting and distributing black bass, Miss. River	86 76
Gathering pickerel spawn	132 53
Collecting and distributing white bass	21 08
Collecting specimens, economic fishes	243 67
Fish exhibit, State Fair	81 49
Miscellaneous expenditures	266 47
Total expenditures, 12 months	$56,512 12
July 1. Balance on hand	3,579 25
	$60,091 37

SUPERINTENDENT'S REPORT.

To the Commissioners of Fisheries of Wisconsin.

GENTLEMEN: In as much as I have advised you from time to time, in detail, as to the progress of the work performed under your direction, I shall confine myself in this report to an account of the business in general; touching on those matters, only, which I deem to be most important or of particular interest to the public or the legislature; and adding such suggestions relating to the work as seem to me apropos. Tables, showing the distribution of fish during the two years to which this report relates, will be found in the appendix.

THE HATCHERIES.

The several hatcheries have been operated with about the usual output of fry from each, during the past two years; and the ponds and buildings at each have been maintained in good repair.

The loss of trout from bacterial disease at the Bayfield hatchery has been much smaller this year than usual.

The Delafield hatchery has been much improved. It has been fenced, ponds built, the grounds graded, shrubbery started and a fine permanent hatchery building erected and equipped.

The new trout hatchery ordered by the legislature of 1905 has been located, the site near Wild Rose purchased and fenced and eight stone-lined ponds built. We were offered free sites in several other places in the state for this hatchery; but in my opinion, you wisely decided to pay a fair price for the Wild Rose site rather than locate in an undesriable place where the land cost nothing. I believe this to be the best place for a trout hatch-

ery in the state. Its location, one-half mile from railway station and a thriving town, affords, also, the very best of natural advantages. The site of this hatchery is on a short tributary of the Pine river, a famous trout stream, and only a few miles from the head of the main river. The land purchased comprises fifty-nine acres and includes not only the tributary stream, over one-half mile in length, but also, nearly one-half mile of the main river as well. The tributary stream, which will supply the principal ponds and buildings of the hatchery, has its head in an oval shaped glen, from about the borders of which numerous springs of pure, cool, crystal-clear water gush forth here and there from shady alcoves, forming a short distance below, a splendid stream containing an abundance of natural food for trout and flowing 1200 gallons per minute. The springs at the head cover about two acres and surround two small timbered islands. The basin of the stream is bordered by high banks, and numerous mounds rear themselves along the alder-fringed stream; the whole being beautifully timbered, with oak, birch, and basswood. I expect this to be one of the finest trout hatcheries in this country.

Two hundred acres of land surrounding a small lake which we use for breeding black bass and adjoining the lands belonging to the Minocqua fish hatchery were purchased from the Land, Log and Lumber Co. last year for $3,000. We have had this land surveyed and the timber scaled, and find that the timber alone is worth more than we paid for the land. Owning this land we own the lake it surrounds and are thereby enabled to use the lake for propagating black bass without danger of encroachment.

The experiments conducted at the Minocqua hatchery with artificial bass nests and in hatching bass eggs on wire trays in the hatchery building have given satisfactory results. The artificial nest devised by Mr. Ripple for this purpose bids fair to be a valuable addition to fish cultural apparatus. This nest is made by imbedding gravel in a mixture of cement and sand in such manner as to closely resemble the spawning bed of a black bass. It can be removed from the pond to permit the eggs of the fish to be transferred to wire trays through a hole in the bottom of the nest. The wire trays containing the eggs are placed

in the hatching house where the eggs are cared for and protected from enemies until planted in open waters as fry or fingerlings.

We have discontinued planting lake trout fry in inland lakes, excepting in those cases where an examination indicates that the lower strata of water is of proper temperature and contains sufficient oxygen during the hot months of summer to sustain the fish.

CAR SHED.

The frame building, which has been used to shed our distributing car for several years was destroyed by a storm early in the summer. The building was insured by the state department of insurance and we received $300 from the state insurance fund in ful payment of this loss.

FISH AND GAME CLUBS.

A number of local rod and gun clubs have been formed in the state during the past year by sportsmen in various localities. Among other purposes for which they have organized is the protection and propagation of fish. These organizations generally take a lively interest in planting fish obtained from the state fish hatcheries, and we are pleased to co-operate with them. It is our purpose to supply such clubs, as liberally as the circumstances will permit, with fish for the localities they represent and afford them such other assistance as we can. Some of these clubs expend considerable money in purchasing stock from private hatcheries for public streams and we have been glad to assist them in transporting the fish.

DISTRIBUTION OF FISH.

June 1st, 1908, the files of the Commission contained 4,500 applications for fish. These applications each contained requests for from one to four kinds. During the year we have delivered 2,510 allotments of fish, various sizes, as high as three allotments, different kinds, being made to one applicant in a few instances.

Superintendent's Report.

The above figures speak for themselves and indicate the great interest taken in our work by the people of the state, but do not fairly show the excess of applications over the number of orders we were able to fill; for, as stated, each application contains requests for from one to four kinds of fish. These applications come from all classes of citizens and all parts of the state, from the populous cities as well as from the sparsely settled and remote sections.

Our distributing car travelled in 1908, within the state, 21,845 miles and has handled fifty-two car loads of fish. Messengers and employees have traveled during the year in connection with our business nearly 75,000 miles and have delivered from baggage cars, 5,656 cans of fish. A total of 9,450 cans of fish have been planted, besides those handled in tanks in the distributing car. For making the distribution of fish from the hatcheries, we have 750 shipping cans, each hatchery being provided with from one hundred to two hundred of these cans. We have found it difficult to handle the distribution with this number of cans notwithstanding we have shifted them from hatchery to hatchery as needed at different times during the shipping season. An additional number of shipping cans should be purchased.

The output of the current year has reached more localities than any distribution of past years, and has been as equitable to all parts of the state as it is practicable for us to make it under present conditions. Mr. Arthur Sykes, chief clerk, has this branch of the work in charge. Through the agency of the long distance telephone he is able to communicate at almost any hours with the hatcheries, fish car, and messengers; and to personally arrange and direct the distribution of fish from the hatcheries.

INCREASE OF FISH IN OUTLYING WATERS.

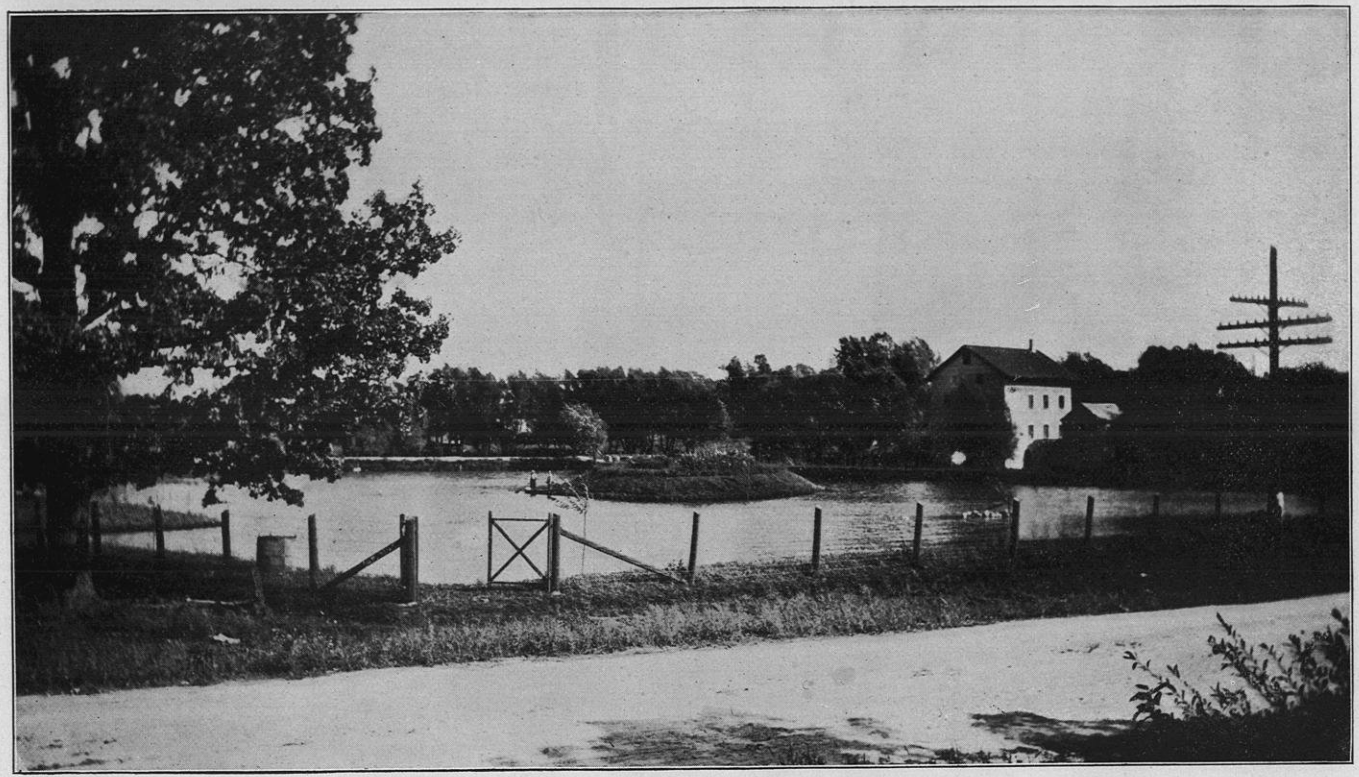
I call your attention to the fact that the lake trout and whitefish are increasing noticeably in the Great Lakes, while the catch of other varieties which are not propagated by the Fish Commission, such as blue-fin, herring, long-jaw, pike, sturgeon, etc., is falling off from year to year; and it is only a question of

time when the catch of these kinds will be *nil* unless something is done in the way of artificial propagation.

About twenty years since, the Fish Commission planted in Chequamegon Bay a large number of blue-fin fry, hatched from eggs collected from inland lakes. Before these plants were made, the blue-fin formed no part of the catch of the fishermen on those waters and they were unknown in the waters of Lake Superior. In due time after these fish were planted the fishermen began to catch them and hundreds of tons were marketed. In a few years the catch of this species diminished until today comparatively few are taken. Now, the fishermen are urging us to plant more blue-fin in preference to the true whitefish, (Coregonus clupeiformis).

For years I have protested against the destruction of young trout and whitefish in the Great Lakes by fishermen using small meshed nets. I have so often explained this matter to you, that you are quite familiar with the subject; and extended comment would be superfluous, hence I will refrain from discussing it. Every possible effort should be made to secure legislation prohibiting the use of nets which will destroy any considerable number of small whitefish and trout. The size of the mesh in nets which may be lawfully used should be increased until the small fish are afforded the protection they sorely need in the outlying waters. Until this is done the fishermen or the state can not expect to derive anything like the largest possible benefits from the work of the Fish Commission. That we are obtaining results from planting trout and whitefish in the Great Lakes is now generally acknowledged without reservation by practical fishermen everywhere; but if the small lake trout and whitefish were accorded the protection they should have, the product of the fisheries of the Great Lakes would increase four-fold.

The following letters, written by fishermen on Lake Michigan, speak for themselves. These were selected from among a number of similar letters by practical fishermen, none of which contained an unfavorable comment.



ONE OF THE BASS PONDS, DELAFIELD.

Superintendent's Report.

MR. JAMES NEVIN, "Racine, Wis., February 23, 1907.
Madison, Wisconsin.

DEAR SIR:—Your letter of the 21st at hand; and will say in regard to planting of whitefish and lake trout that we have been successful. The fry have been so quick and lively when received here that you would think they were big fish. Will also say that the whitefish and trout fry has been planted in not less than fifteen fathoms of waters or ninety feet. In planting whitefish and trout they have been more plentiful. We have noticed in the last two or three years that the planting of fry helps the fishing industry and we are glad to take care of all kinds of fish fry you can send us.

Yours Respectfully,
CAPT. CHARLES HYTTEL."

MR. JAMES NEVIN, "Sheboygan, Wis., February 23, 1907.
Superintendent of Fisheries,
Madison, Wisconsin.

DEAR SIR:—Yours of the 21st received. The State Fish Commission has planted a large number of lake trout and whitefish out from Sheboygan, and I have always gone out with the tugs and helped plant them. They have always been in good shape when they came here; and after we have planted them in Lake Michigan I have lingered about the planting place several times for half an hour or such a matter to watch the little fish to see how they come out; but never noticed any dead ones. They were just as lively as they could be. I never saw any washed ashore, nor do I think anybody else did. If anyone has said they found any of these fish washed ashore here around Sheboygan I believe they do not know what they are talking about.

I have been following up the fishing business for the past thirty-five years and I never saw so many small trout in the lake as we have now. Where do they come from? They were planted here from the hatcheries. About six years ago you wrote me and wanted to know how far away from Sheboygan they were fishing with pound nets. At that time there were no pound nets within twenty-five miles north of Sheboygan and about eight miles south of Sheboygan, and so that was a good place to plant some whitefish; and you have planted about two car loads of whitefish here each year since. About five years ago, there was a fisherman who set a pound net, about one and one-half miles south of Sheboygan, but he had to take it out again. He could not catch enough to eat. Last summer a fisherman set a net there and he caught all kinds of whitefish. Now where did they come from? Simply because they were planted there by the hatcheries.

If any one has followed up the fishing industry I think I have, and the only way to increase the fish in Lake Michigan is to enlarge the hatcheries and plant lots of them. If the state ever invested any money that has yielded good returns it was the money they have spent for fish hatcheries.

Very truly yours,
E. SCHNEIDEWIND."

Provision is made in our laws for what is known as a close season against fishing on Lakes Michigan and Superior. This is supposed to operate to protect the lake trout and whitefish during the spawning time, its purpose being to secure to the waters the natural increase of fish arising from spawn deposited during this period.

Superintendent's Report.

Fish culturists on the Great Lakes are generally agreed that not one egg in a thousand deposited naturally by the lake trout and whitefish is impregnated and that the increase from natural spawning during the close season is on this account very small. I concur in this opinion and believe that far better results would be obtained by permitting the fishermen to fish with not to exceed two gangs of nets in the water at one time, during the period now closed to fishing; and compelling them to collect, fertilize and plant on the spawning grounds, the ripe ova of fish caught during the season now closed against fishing. Ninety per cent of the eggs collected in this way would be fertilized, whereas, not one per cent would be fertilized if the fish deposited the eggs in the natural way. I believe that we should endeavor to secure the passage of a law permitting fishing under the restrictions named during the season now closed on the Great Lakes; requiring the fishermen to obtain from the Fish Commission a permit to fish during this period, and making it unlawful to fish during the close season without such permit. The fishermen should be compelled to deliver to the agents of the Fish Commission for the state fish hatcheries the eggs they take, when requested to do so; and to plant on the spawning grounds, as stated, all other spawn collected.

THE FISHERIES OF THE MISSISSIPPI RIVER.

The fisheries of the Mississippi river are of great and increasing importance. The carp is the principal fish caught. The fishermen on these waters are making more money by catching and marketing the despised carp than they ever made in past years from all other kinds; and they freely acknowledge that if it were not for the carp they would not be able to subsist by fishing. This by no means indicates that carp are the only fish in the waters, for thousands of pounds of other varieties are marketed each year. The Mississippi river is, acre for acre, the most productive of commercial fish of any of our waters and is also the best and most prolific fish breeding grounds belonging to the state.

As an indication of what the Mississippi river carp fisheries amount to—A fish dealer located at Bay City, Wis., stated before

the Fish and Game Committee of the legislature of 1907 that he was one of four principal buyers of fish along the Mississippi river in our state and that during the previous winter he had shipped one-hundred fourteen car loads of fish for which he paid $127,000.

Sharp, Spriggles and Amoth of Bay City, Wisconsin caught, in December, 1907, with one haul of a seine, seven hundred feet long, 55,000 pounds of carp for which they received four and one-half cents per pound.

In the fall of 1907, Mr. L. F. May caught in a single haul of a seine, 90,000 lbs. of fish, principally carp. From this haul he marketed 71,660 lbs. for which he received $3,171.42. The "No. 1" carp brought him from five to five and one-half cents per pound. During the year 1907 he marketed 216,822 lbs. of fish, over one-fourth of which were dressed before weight was taken. More than three-fourths of the entire catch for the year were carp. His income during the year from fishing exceeded $10,000.00. These are instances which have come to my notice. Doubtless others have done as well.

New York is the principal market for the carp and buffalo fish caught by the Mississippi river fishermen.

LICENSE FOR FISHERMEN.

The legislature of 1907 enacted a law requiring net fishermen on the outlying waters to obtain license from the State to fish. This law is defective in some particulars, but is a step in the right direction. Net fishermen in the outlying waters of the state and the Mississippi river should be required to pay a nominal license fee for the privilege of fishing. They of course pay taxes on their equipment and property on land for the same reason that others pay taxes on their personal property and real estate; but the waters from which they obtain their living are not taxed, notwithstanding the state expends a great deal of money in protecting and stocking them with fish, primarily for the benefit of the fishermen. It seems just to me that the fishermen should reimburse the state for protecting the fish and stocking the water for their benefit.

Superintendent's Report.

COLLECTION OF FISH FROM THE MISSISSIPPI RIVER.

In previous reports, I have repeatedly mentioned the loss of small fish which occurs on the Mississippi river bottoms during the summer, fall and winter months, due to the shallow ponds and sloughs drying out or freezing. Some years the loss of young fish in this region is comparatively small. Other years it amounts to untold millions of carp, bull heads, catfish, crappies, black bass, pike and pickerel, ranging from one to six inches in length. This year the Mississippi river has been very low and an enormous loss of these young fish has occurred. Notwithstanding the fact that it seemed probable that the close of the fiscal year will find us with a deficit to face; the inevitable tremendous loss of fish along the river impelled us to detail our distributing car and a crew of men to save as many of these fish as possible. The work was begun August 16th and we discontinued it September 22nd, after having distributed 133,500 black bass fingerlings to inland waters besides planting a large number of other fish in the Mississippi river and contiguous lakes. These fish were all collected from a short stretch of territory in the locality of Genoa, and were as "A drop in the bucket," when compared with what we might have done if our funds had been such as to permit us to continue the work. It is distressing to think of the enormous loss of valuable fish which has occurred along the river during the past few weeks and which must inevitably continue during the fall and winter months. This loss occurs every year to a greater or less extent. Some years it is so small that, with the funds at our disposal, we have thought it hardly worth while to undertake the work of saving the fish. Other years, like the present one, thousands of dollars could have been profitably spent in this work. In the past our efforts have been to save only the best fish as it was utterly impossible for us to save all kinds with the small amount of money available for the purpose. That it would pay the state to save as many of these food fish of all kinds as possible, there can be no doubt. The principal part of them could be planted in the Mississippi river or contiguous lakes lying along the river and a large number of the best game

species could be transported to inland waters. The commercial fishermen and sportsmen along the river have objected in the past to our transporting to inland waters the game fish taken from the sloughs; but if all kinds could be saved and planted as suggested above, all concerned would be satisfied, and the commercial fisheries of the river, the value of the products of which runs up into the hundreds of thousands of dollars, would be greatly benefited.

It is impossible for us to forecast the years of plenty in this work, hence we are never prepared to do all that might be done in this connection, as our funds are barely adequate to pay the running expenses of the hatcheries. To withhold from the hatcheries each year a sufficient sum to do justice to this part of our business would sorely cripple them. Therefore, in order that we may be prepared to save these young fish in the future, especially in years like the present when the loss is likely to be very great, I suggest that you ask the legislature to appropriate for this special purpose such sum as seems best in your judgment.

FISHWAYS IN DAMS.

We have not made a general canvass of the dams in the state to determine where fishways were necessary, as no appropriation of money has been made for the purpose. But whenever we have been requested to examine a dam, we have obtained from those making the complaint a complete statement as to conditions existing at the dam, and if after receiving such statement it seemed probable that a fishway would be useful, I, or another representative of this department, have made a personal examination of the dam and reported to you for your decision.

In view of the fact that it has not been well established as to just what extent a fishway is useful in a dam, and remembering that the conditions found at different dams are so various, it has seemed the part of wisdom to me to proceed cautiously in ordering fishways. Our policy in this matter has been to order fishways or compel the removal of gates or the dam itself in cases where,—the dam is used for flooding purposes, in old

dams out of use, in all new dams in process of construction, and in all other cases where it appeared that a fishway would materially help in the natural propagation of fish in streams.

Further investigation of this matter may teach us that fishways will be of use in many places, where we now hesitate to order them; and possibly we may find in the future that the public good will be best served by ordering fishways in all dams where they will not be a positive detriment to the fishery on the stream.

In as much as no appropriation has been made for this work and the state has deputy fish and game wardens in all parts of the commonwealth, the business of investigating dams and ordering fishways could be done more advantageously by the state fish and game warden; and I suggest that the legislature be asked to assign this work in its entirety to that department.

EXAMINATION OF STREAMS AND LAKES.

The science and art of fish culture have progressed marvelously in this country during the past twenty-five years, along the lines of fish hatching; the transportation of fish and eggs and in knowledge of the life history of the commercial and game fishes: but, comparatively little is known of the natural food of the young fish we plant and of the conditions under which they thrive. We carefully hatch and develop the fish at the hatcheries until they have reached perhaps the fingerling size, then we turn them over to the layman with instruction (which he often disregards), to be planted in waters of which we have but a superficial knowledge at best. Under these circumstances it is surprising that we get so generally satisfactory results from planting fish.

The time has come when some plan, comprising a systematic and progressive examination of our waters should be formulated and its execution begun. In the beginning an examination of the streams and lakes of the state should be made to determine, in the light of our present knowledge, the kinds of fish which should be planted in each stream or body of water to obtain the best results; and to study the conditions existing in each case

as they relate to the planting and propagation of fish. A carefully prepared record should be made of the findings as to each lake or stream, to be used as a guide, so far as practicable, in determining the kinds and numbers of fish which can be most profitably planted in each case, and the localities and time of year such plants can be made to the best advantage. It is particularly desirable that the streams in which we plant trout fry should be investigated as soon as practicable. Scientific inquiry as to the food on which the young fish we plant subsist, its history, etc., should follow, as rapidly as circumstances will permit, the general examination of our waters suggested. There is no question in my mind but millions of fish turned out by the hatcheries under the present system come to naught and might as well be dumped on a dusty road or an open prairie as to be planted in the haphazard manner in which many fish from our hatcheries are now planted. Even when planted with the greatest care in waters of which we have no accurate knowledge; and in which conditions as to food, temperature, etc., at the time the plant is made, are unknown to us; (notwithstanding our efforts to make the plant timely and to supply the waters with the fish which, from our general knowledge we deem best suited for them) there is doubtless an enormous loss of fish distributed from the hatcheries today which might, and in time will, be overcome.

Under the direction of Dr. Birge and in connection with the state Geological and Natural History Survey, an examination has been made of inland lakes containing the true whitefish and lake trout for the purpose of determining in what respects, with reference to the conditions which affect fish life in the waters, these lakes differ from the lakes in which we have unsuccessfully planted lake trout. As a result of this work it has been found that lake trout and whitefish are found only in those deep lakes of low temperature which, during the summer months, contain a considerable amount of oxygen at or near the bottom. There are many deep lakes which are cool at the bottom, but which are devoid of oxygen below a certain depth during the summer, in which lake trout will not subsist. Since this discovery has been made we have discontinued planting lake trout fry in such lakes.

We now make plants of lake trout in inland lakes only after an examination has been made and it has been found that sufficient oxygen is present in the water at the bottom to warrant the belief that fish will subsist there. We wasted a lot of fish in years past trying to introduce them into lakes in which, from all appearances, they should thrive. Here we have an instance of the great practical value of scientific investigation and a precise knowledge of conditions in the waters.

Any scheme for the examination of our waters should have for its purpose, primarily, the gaining, in as short a period as possible, information which will be of undoubted practical value to us in our work; rather than to obtain knowledge purely scientific in its application. We should have definite purposes and ends in view when this work is begun.

APPROPRIATIONS.

Standing annual appropriations of money amounting to $30,000. have been used by the Commissioners of Fisheries for several years to operate the hatcheries, etc. Four years ago, special appropriations to establish two new hatcheries were made and the legislature of 1907 granted an appropriation to complete and maintain those hatcheries for the biennial period, 1907–08; but no provision was made for the running expenses of these hatcheries in the future. The new hatcheries are now in operation; though, as you know, they are not completed. The funds appropriated for them have in my judgment been used to the very best possible advantage.

At Delafield we have completed four ponds and constructed a permanent hatchery building, besides adding many other improvements such as fencing, etc. We are still in need of an overseer's residence and a barn at this plant.

We have purchased at Wild Rose fifty-nine acres of land and have constructed, with stone-lined embankments and concrete bulkheads, eight ponds besides fencing the grounds and making minor improvements. It will be a number of years before this hatchery is completed; but we shall soon need a permanent hatch-

BASS PONDS, (HATCHERY BUILDING AT THE RIGHT) DELAFIELD HATCHERY.

ery building and an overseer's residence besides an additional number of ponds and other improvements, equipment, etc. The standing annual appropriations to the Commission, amounting to $30,000, were barely adequate to maintain and run the hatcheries belonging to the state before the new hatcheries were ordered. It seems clear, therefore, that an additional appropriation to make necessary improvements at these new hatcheries, to equip them and pay running expenses, must be forth-coming or the hatcheries abandoned.

Elsewhere, I have spoken of the desirability of a special appropriation to save fish from the Mississippi river sloughs. Altogether it seems to me that the legislature should be asked to add to the present standing appropriations a sum sufficient to take care of these new hatcheries as well as to place us in position to do necessary work on the Mississippi river. I suggest that the legislature be urged to cover these expenditures by a standing, annual appropriation in order that we may proceed with our work with confidence as to the future. Otherwise we shall be obliged to take up the time of each successive legislature with appeals for funds to go ahead with the work authorized by preceding legislatures.

ACKNOWLEDGMENTS.

During the years 1907 and 1908 we received from the Bureau of Fisheries of United States and hatched in our hatcheries, fish eggs as follows: 14,500,000 lake trout, 40,000,000 whitefish, 50,000 grayling, 50,000 steel-head trout, 100,000 rainbow trout, and 20,000 land locked salmon. The fry from these eggs were planted in Wisconsin waters as shown in the appended tables of distribution. A list of plants of fish made by the national bureau of fisheries in Wisconsin waters during the past year will be found with other tables appended. I take pleasure in mentioning these liberal allotments of fish and eggs by the fisheries department of the United States to citizens within our state, as they comprise an important addition to the stock of fish in our waters. We will always be thankful recipients of like favors.

Superintendent's Report.

We are indebted to the railway companies of the state for transporting, free, our distributing car and our fish cans on baggage cars; and to the employees of the railway companies for valuable assistance given in forwarding our fish cans and car with care and dispatch at all times. I gratefully acknowledge these courtesies to our department.

THE BOARD.

The Board of Fish Commissioners has become a very important branch of the State Government. In my opinion the State of Wisconsin has been extremely fortunate in the organization, membership and policy of its Board of Fish Commissioners almost from the beginning. The board is non-partisan and has been composed of successful business and professional men who have always insisted on practical results for the money expended. Notwithstanding the fact that the commissioners serve without compensation and have derived no political or pecuniary advantages from their membership on the board, their interest in the business has been such and their efforts so well directed that the work of the Commission is second to that of no other state fish commission in extent and practical results; and the hatcheries of no other state are more extensive, or better equipped with up to date appliances, or embrace a larger acreage. We now have five permanent fish hatcheries and one hatching station, the land and water area of which comprise over 900 acres. The locations for these hatcheries have been carefully selected and the commission has shown great foresight and wisdom in securing in each case sufficient land and water for future needs. This property will become more valuable from year to year. An idea of this increase in value may be given by instancing the purchase of a quarter section of land which it was found necessary to buy in order to control the stream on which the Bayfield hatchery is located. The Commission paid $100 for this piece of land. The timber, alone, on this land is now worth, commercially, several thousand dollars.

Superintendent's Report.

Some states make larger appropriations of money for the propagation of fish than Wisconsin; but after visiting as I have the hatcheries of the principal states engaged in fish cultural work as well as many private and government hatcheries, I am convinced that our state possesses more large up to date well equipped hatcheries; a larger acreage of land and water devoted to fish culture; and receives more for the money expended than any other state in the union. And Wisconsin deserves all that has been done for it in fish cultural work, for it is doubtful if another state in the union possesses greater natural advantages, a larger acreage of highly productive water, a greater variety of fine fish, more streams and inland lakes, or more beautiful, enchanting lakes and streams than ours. These splendid possessions of the state deserve to be fostered, protected and improved in every possible manner, not only for the food products they yield, but as health-giving places of recreation and rest for our people; and as means of livelihood of many citizens depending directly on the fisheries or upon summer visitors and tourists who, attracted hither by the beauty and excellence of our waters, spend thousands of dollars in our state each year. I believe that the public in general derives greater direct benefit from the money expended for fish culture, dollar for dollar, than from any other appropriation of money made by the state.

CONCLUSION.

Few people realize the responsibility of the work entrusted to our employees in general, or the constant care and watchfulness, necessary to its successful performance. I take pleasure in saying,—the employees of the commission under my direction have given us the very best possible service in all departments and under all circumstances. Their zeal and hearty co-operation has been the greatest factor in making this one of the most satisfactory years in accomplishments and results in the history of the Commission. They have worked faithfully and well, night and day when necessary; and each has performed his part to the best of his ability.

Superintendent's Report.

In all branches of fish culture applicable to the waters of our state, we have endeavored to keep abreast of the times adopting and using new methods and apparatus whenever and wherever found practicable; conducting experiments and investigations along various lines; ever solicitous and watchful for the things that make for improvement and progress, to the end that Wisconsin shall always be found in the front rank of fish cultural achievement.

Respectfully submitted,

JAS. NEVIN,
Superintendent of Fisheries.

Distribution of Fish.

DISTRIBUTION OF FISH.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907.

Name and Post Office of Applicant.	Where Planted	No. of Fish.
ADAMS COUNTY—		
E. H. Townsend, New Lisbon	Schonover and Jackson creeks	8,000
ASHLAND COUNTY—		
Andy Wood, Glidden	Creek in Sec. 4, T. 42, R. 26..	3,000
L. E. Gordon, Glidden	Creek in Sec. 19 and 20, T. 43, R. 26	3,000
Edward Gordon, Glidden	Creek in Sec. 27 and 23, T. 43, R. 2 E.	3,000
Lin W. Gordon, Glidden	Dryden creek	3,000
J. J. Stoltz, Glidden	Head Fork of East Chippewa river	3,000
John Ripplinger, Glidden	Augustin creek	3,000
George Sell, Glidden	Tyler creek	3,000
Wm. Whiteside, Butternut	Spring creek	3,000
Herman Buechner, Butternut	Beaver creek	3,000
E. G. McAnulty, Butternut	Spillie creek	3,000
Wm. Lindemeyer, Butternut	Rabbit creek	3,000
Chas. Kleinsteiber, Butternut	Pine creek	3,000
Theo. R. Yankee, Butternut	Spillie creek	3,000
Theo. W. G. Nohl, Ashland	Spring creek	3,000
Jens Wilman, Ashland	Whittlesey creek	3,000
Chas. M. Wilman, Ashland	Hazard creek	3,000
Fred M. Cole, Ashland	Fish creek	3,000
Geo. S. Cook, Ashland	Rapire creek	3,000
Bige Buchanan, Ashland	Upper Pine creek	6,000
Aug. Johnson, Ashland Junction	Fish creek	6,000
J. V. Freeman, Ashland	Buck creek	6,000
		72,000
BARRON COUNTY—		
F. A. Portland, Clear Lake	Silver creek	3,000
BAYFIELD COUNTY—		
George F. Catlin, Dellwood	North Branch of Whittlesey creek	6,000
C. O. Sowder, Washburn	Four-mile creek	6,000
D. M. Maxcy, Washburn	Little Sioux creek	6,000
Wm. Olson, Washburn	Flag river	3,000
D. J. Estabrook, Washburn	Souix river	6,000
Olaf Olson, Washburn	Bark creek	6,000
H. R. Robinson, Washburn	Cranberry river	3,000
		36,000
BROWN COUNTY—		
J. E. Powlas, Oneida	Trout creek	4,000
BUFFALO COUNTY—		
P. F. Shaw, Mondovi	Ford creek	2,000
C. A. Costley, Mondovi	Big creek	2,000
H. H. Scott, Mondovi	Rock creek	2,000
J. H. Johnson, Mondovi	Dutch creek	2,000
Ole J. Ward, Mondovi	Armour creek	2,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
BUFFALO COUNTY—Continued.		
John S. Hayes, Mondovi	Creek No. 15	2,000
A. D. Alt, Mondovi	Elk creek	2,000
Thos. Ward, Mondovi	Holmes creek	2,000
Chas. Haber, Alma	Rutchins spring	3,000
John Ganteulein, Alma	Schultz creek	6,000
		25,000
CHIPPEWA COUNTY—		
Nels Stalheim, Stanley	Swan and Otter creeks	6,000
A. S. Little, Stanley	Simm creek	6,000
Henry Moore, Boyd	Shilts creek	3,000
Louis Mittermeyer, Boyd	Shilts creek	3,000
Bert Loiselle, Boyd	Hay creek	3,000
John R. Agnew, Cadott	Big Drywood creek	3,000
Wm. T. Gilbert, Cadott	Clear Creek	3,000
D. H. Wolcott, Cadott	Little Drywood creek	3,000
Paul E. Hass, Cadott	Alder creek	3,000
		33,000
CLARK COUNTY—		
Geo. K. Redmond, Neillsville	Mound creek	2,000
S. C. Wightman, Neillsville	Conlin creek	2,000
S. J. Barrett, Neillsville	Hay creek	2,000
Hugh Barrett, Neillsville	Cameron creek	2,000
Beryon H. Wells, Neillsville	Birch creek	2,000
		10,000
COLUMBIA COUNTY—		
A. R. Ketchum, Portage	O'Keefe creek	4,000
Frank Moran, Portage	Smith's creek	2,000
F. W. Kiefer, Portage	Little Neenah creek	2,000
R. C. Young, Poynette	Sowens creek	2,000
E. Hinkson, Poynette	Hinkson creek	4,000
H. A. McKenzie, Poynette	Poynette creek	4,000
Daniel Bentley, Poynette	Rocky run	4,000
Chas. Raimer, Poynette	Rocky run	4,000
E. T. Wheeler, Kilbourn	Hulbert creek	4,000
John Roembach, Kilbourn	Corning creek	4,000
A. S. Watermann, Kilbourn	Watermann creek	4,000
Chas. Caldwell, Rio	Spring brook	4,000
E. O. Larson, Rio	Dutch creek	4,000
A. J. Calkin, Wyocena	Trout brook	4,000
A. W. English, Wyocena	Spring brook	4,000
		54,000
CRAWFORD COUNTY—		
Jas. J. Fesar, Wauzeka	Plum creek	4,000
P. Blanha, Wauzeka	Little Kickapoo creek	4,000
Silas B. Irving, Soldiers Grove	Knapp's creek	6,000
Geo. H. Davidson, Soldiers Grove	Reads and Day creeks	24,000
		38,000
DODGE COUNTY—		
Eugene Ziegler, Mayville	Koepels and Wanninger creeks	6,000
DOOR COUNTY—		
Samuel Perry, Forestville	Stoney creek	2,000
P. M. Perry, Forestville	Wolf river	4,000
		6,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
DOUGLAS COUNTY—		
N. Lucius, Jr., Solon Springs	Brule river	3,000
E. J. Favell, Superior	Brule river	3,000
J. M. Sayles, Solon Springs	Rock creek	6,000
Henry Beglinger, Jr., Gordon	Spring creek	6,000
E. A. Arnold, Superior	Shean's creeks	6,000
F. J. Kenyon, Superior	Railton creek	6,000
Louis Efaw, Hawthorne	Middle river	6,000
W. H. Bonnell, Hawthorne	Middle river	6,000
Arch McKay, Dedham	Little Balsam creek	6,000
F. J. Seguin, Superior	Rock creek	3,000
I. L. Lenroot, Superior	Copper creek	3,000
W. R. Foley, Superior	Gooseberry creek	3,000
Helge Johnson, Superior	Little Balsam creek	3,000
F. J. Seguin, Superior	Empire creek	6,000
Julius L. Cohen, Superior	Big Balsam creek	3,000
Leo. B. Wilkinson, Superior	State Line creek	3,000
P. E. Elevier, Superior	Big Balsam creek	3,000
E. J. St. Onge, Superior	Spring brook	6,000
Geo. A. Bubar, Gordon	Miles creek	6,000
		87,000
DUNN COUNTY—		
Wm. P. Unser, Eau Galle	Barney branch	2,000
Geo. P. Topliss, Eau Galle	Knight creek	2,000
P. H. Daugherty, Eau Galle	Little Missouri creek	2,000
H. Heath, Eau Galle	Hay creek	2,000
Edd. Wilson, Eau Galle	Big Missouri creek	2,000
A. P. Pillsbury, Menomonie	Varney creek	3,000
C. B. Stone, Menomonie	McCarthy creek	3,000
M. A. Hanson, Menomonie	Little Elk creek	3,000
E. Marks, Menomonie	Irving creek	3,000
C. P. Graven, Menomonie	Simonson creek	3,000
W. H. Becker, Menomonie	Simonson creek	3,000
J. B. Stotz, Menomonie	Black creek	3,000
E. Trautman, Menomonie	Stoned creek	3,000
B. Tollefson, Colfax	Iverson creek	3,000
N. E. Nelson, Colfax	Ingelretson creek	3,000
Hans M. Olson, Colfax	Strand creek	3,000
M. Fjelstad, Colfax	Gulikson creek	3,000
Robt. R. Porter, Wheeler	Little Beaver creek	6,000
Ed. Blank, Wheeler	Beaver creek	3,000
H. H. Lake, Wheeler	La Farge creek	3,000
F. J. Converse, Wheeler	Big Beaver creek	3,000
P. Nooney, Wheeler	Big Beaver creek	3,000
Thos. Stout, Jr., Clear Lake	Hay river	3,000
		67,000
EAU CLAIRE COUNTY—		
J. E. Davey, Eau Claire	Elk creek	3,000
Wm. Whiteside, Eau Claire	Coon creek	3,000
A. J. Kittsman, Eau Claire	Clear creek	3,000
W. J. Seney, Eau Claire	Seven-mile creek	6,000
F. E. Rowell, Eau Claire	Coon creek	3,000
Chas. F. Winslow, Eau Claire	Rock creek	6,000
		24,000
FOND DU LAC COUNTY—		
David Thomas, Ripon	Dakin creek	2,000
J. B. Barlow Jr., Ripon	White creek	2,000
J. W. Pierce, Ripon	Powell creek	2,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
FOND DU LAC COUNTY—Continued.		
E. S. Pedrich, Ripon	Powell creek	2,000
C E. Haseltine, Ripon	Silver creek	2,000
A. H. Fisher, Ripon	Dakin creek	2,000
Bonefer Enders, St. Cloud	Ditters creek	4,000
		16,000
FOREST COUNTY—		
D. W. Connor, Laona	Rat river	6,000
W. D. Connor, Laona	Spring creek	3,000
Connor Lumber and Land Co., Laona	Trib. Rat river	3,000
Joseph Martin, Laona	Tribs. Rat river	3,000
		15,000
GRANT COUNTY—		
John W. Brackett, Lancaster	Borah creek	4,000
John Decker, Lancaster	Austin creek	4,000
Lou Starr, Lancaster	Walker creek	2,000
Will Muller, Lancaster	McPherson creek	2,000
		12,000
GREEN COUNTY—		
N. C. Durse, New Glarus	Little Sugar river	4,000
GREEN LAKE COUNTY—		
Ed. Borst, Princeton	Snake creek	4,000
IOWA COUNTY—		
M. C. Mc Intyre, Avoca	Swinehart creek	4,000
A. Apple, Mineral Point	Lynch creek	4,000
J. M. Mulhaim, Mineral Point	McKenna creek	4,000
W. H. Thomas, Dodgeville	Roberts creek	2,000
Henry Conely, Ridgeway	Coley creek	4,000
F. F. Starry, Barneveld	Harris creek	2,000
Lance Jones, Barneveld	Jones Valley creek	2,000
O. J. Owens, Barneveld	Walnut Hollow creek	2,000
Albert McKelson, Arena	Price creek	2,000
J. W. Pryor, Barneveld	Trout creek	2,000
C. E. Jewell, Barneveld	Hayes creek	2,000
H. C. Strong, Dodgeville	Elam creek	2,000
J. J. Persons, Dodgeville	Survey creek	2,000
W. B. Stratman, Dodgeville	Cox-Hollow creek	2,000
Edw. A. Perkins, Dodgeville	Harker creek	2,000
J. M. Reese, Dodgeville	Anderson creek	2,000
Patrick Smith, Barneveld	Smith creek	2,000
W. E. Williams, Dodgeville	Harker creek	2,000
F. P. Campton, Jonesdale	Campton Branch creek	4,000
Jesse L. Teague, Waldwich	Burgess and Hutchins creek	4,000
		52,000
IRON COUNTY—		
M. J. Connors, Hurley	Montreal river	3,000
Henry Meade, Hurley	Front creek	6,000
Geo. C. Foster, Hurley	Spring creek	6,000
Fred Davis, Hurley	Pike lake creek	6,000
		21,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
JACKSON COUNTY—		
Carl Seckler, Alma Center	Secklers creek	2,000
Andrew Napstad, Alma Center	East part of Pigeon creek	2,000
R. B. Johnson, Alma Center	Cisna creek	2,000
L. F. Wheaton, Alma Center	Stockwell creek	2,000
J. B. Miller, Alma Center	Town creek	2,000
A. H. Griggs, Hixton	Judkins Holmes creek	2,000
Ed. Nelson, Northfield	South and North Fork of Pigeon creek	4,000
L. M. McDirmid, Hixton	Rover creek	2,000
H. A. Miller, Hixton	Pine creek	2,000
Gabriel Anderson, Disco	Beaver creek	4,000
Gay R. Sechler, Sechlervlle	Sly creek	2,000
Rufus A. Jones, Black River Falls	French creek	3,000
R. G. Mason, Black River Falls	Trout run	3,000
Dudley Jones, Black River Falls	Town creek	3,000
W. K. Mills, Black River Falls	Van Hersit creek	3,000
Rev. W. F. Emery, Black River Falls	Allen creek	3,000
Albert P. Jones, Black River Falls	Robinson creek	3,000
L. M. Taylor, Black River Falls	Clear creek	3,000
		47,000
JUNEAU COUNTY—		
Elmer S. Wetherby, Mauston	Mile creek	4,000
John B. Edwards, Mauston	Seven-mile creek	4,000
G. F. Hayes, Lyndon Station	Kildare creek	4,000
Geo. Jirsa, Lyndon Station	Lyndon creek	2,000
James Nevin, Lyndon Station	Harvey creek	2,000
Geo. E. Eakin, Lyndon Station	Lyndon creek	2,000
C. J. Phillips, Camp Douglas	Senate creek	3,000
J. A. Crosby, Elroy	Brewer creek	3,000
John Galvin, Elroy	Brewer creek	3,000
Jas. Conway, Elroy	Moor creek	3,000
John E. Hart, Elroy	Brewer creek	3,000
Carl O. Vogel, Elroy	Baraboo river	3,000
Irwin A. Pearsall, Elroy	Branch Baraboo river	3,000
		39,000
KEWAUNEE COUNTY—		
Felix Moraux, Luxenburg	Little Scarbora river	2,000
Henry Veeser, Luxenburg	Little Scarbora river	2,000
J. H. Rooney, Casco	Scarbora river and Casco creek	4,000
John Barta, Casco	Decker creek	4,000
August F. Radue, Luxenburg	Trib. Kewaunee river	4,000
Jas. Musil, Kewaunee	Clyde creek	4,000
		20,000
LA CROSSE COUNTY—		
C. L. Lien, North La Crosse	Sand Lake-coulee creek	4,000
Edward Wheeler, North La Crosse	Gills Coulee creek	4,000
A. Hirshheimer, La Crosse	North Branch Crow creek	6,000
Casper Andereg, La Crosse	Marmon-coulee creek and spring	6,000
		20,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
LA FAYETTE COUNTY—		
Jas. C. Kline, Darlington	Otter creek	4,000
Jas. McGinty, Darlington	Lovetts branch	4,000
W. R. Law, Darlington	Wood's branch	4,000
George Gould, Blanchardville	Rob creek	4,000
W. E. Robinson, Blanchardville	Rob creek	2,000
H. D. Thomas, Blanchardville	Cleary creek	4,000
James Blanchard, Blanchardville	McKenna creek	2,000
		24,000
LANGLADE COUNTY—		
Arthur B. Goodrich, Antigo	Hunting river	3,000
Fred Hayssen, Antigo	Antigo Spring brook	3,000
C. L. Leykom, Antigo	Tyrells creek	3,000
Herman A. Miller, Polar	Flowage creek	6,000
E. H. Van Ostrand, Antigo	Evergreen river	6,000
		21,000
LINCOLN COUNTY—		
H. E. Kluetz, Merrill	Prairie river	3,000
W. W. Thielman, Merrill	Prairie river	3,000
D. B. Rimhart, Merrill	Spring creek	3,000
Fred G. Rossman, Merrill	North Branch Pine river	3,000
L. W. Kubasta, Merrill	Prairie river	3,000
L. W. Kaiser, Merrill	Prairie river	3,000
Geo. A. Schroeder, Merrill	Copper creek	3,000
Chas. F. Fowler, Merrill	Prairie river	3,000
John Van Hecke, Merrill	Prairie river	3,000
A. B. Nelson, Merrill	Prairie river	3,000
John Hayman, Dudley	Prairie river	3,000
F. X. Juneau, Dudley	Prairie river	3,000
C. E. Macomber, Tomahawk	Middle Branch of Pine creek South Branch of Big Pine creek	3,000
J. A. Fitzgerald, Tomahawk	Big Pine creek	3,000
W. F. Bingham, Tomahawk	Little Pine creek	3,000
O. F. Headstream, Tomahawk	Rice creek	3,000
F. L. Miller, Irma	Litttle Pine creek	3,000
J. C. Morgan, Irma	Litttle Pine creek	3,000
		54,000
MANITOWOC COUNTY—		
S. W. Randolph, Manitowoc	Meeme and Cleveland creeks.	21,000
MARATHON COUNTY—		
H. A. Fricke, Marathon	Rib river	3,000
A. J. Schneiders, Marathon	Scotsch creek	3,000
Fred Prehn, Marathon	Four-mile creek	3,000
Jas. W. Kierstein, Marathon	Loy creek	3,000
Neal Brown, Wausau	Plover river	30,000
H. J. Blanchard Jr., Colby	Dake and Dill creeks	3,000
Henry B. Eder, Colby	Randel creek	3,000
A. Lamont, Colby	Spring creek	3,000
Colby Gun Club	East Fork Poplar creek	3,000
Christ Glenzer, Colby	Poplar creek	3,000
O. C. Belanger, Wausau	Black creek	3,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
MARATHON COUNTY—Continued.		
Herman R. Seim, Wausau	Sand creek	3,000
Alex Fehl, Wausau	Mow creek	3,000
F. E. Dalkie, Wausau	Cain creek	3,000
H. J. Dern, Wausau	Mow and Sand creek	3,000
C. E. Wescott, Wausau	Four-mile creek	3,000
		75,000
MARQUETTE COUNTY—		
W. J. Ogle, Oxford	Sorenson creek	6,000
Ole Sorenson, Oxford	Chency creek	8,000
G. A. Crawford, Liberty Bluff	Crowford creek	4,000
Wm. Haney, Westfield	Schatzke creek	2,000
Riley Collins, Westfield	Fountain creek	2,000
C. E. Babcock, Westfield	McGinnis creek	2,000
A. Williams, Westfield	Oxford creek	2,000
C. C. Fuller, Westfield	Oxford creek	2,000
Jacob Fenner, Westfield	Head of Duck creek	2,000
Alma Carpenter, Westfield	Cave creek	2,000
F. W. Meinke, Westfield	Schatzke creek	4,000
Owen Goodwin, Neshkoro	Birch creek	2,000
R. J. Marr, Neshkoro	Spring brook	4,000
And. Ryan, Neshkoro	Sucker creek	2,000
M. Moriarty, Rodney	Maars creek	4,000
		48,000
MONROE COUNTY—		
W. E. Bartels, Tomah	Tar creek	2,000
F. E. Vesper, Tomah	Deer creek	2,000
R. G. Williams, Tomah	Mill creek	2,000
E. A. Winter, Tomah	Silver creek	2,000
H. C. Spaulding, Tomah	Silver creek	2,000
C. H. Maxson, Tomah	Deer creek	2,000
Louis Fix, Tomah	Tar creek	2,000
W. L. Howes, Tomah	Council creek	4,000
F. L. Fieting, Tomah	Dixon creek	2,000
W. H. Rosa, Bacon	Stilwel and Sparta creeks	4,000
E. J. Brooks, Sparta	Parks creek	3,000
Robt. A. Merrill, Sparta	Swamp creek	3,000
Orville L. Arnold, Sparta	West's creek	3,000
James A. Cole, Cataract	Soper and Davis creeks	6,000
Fred A. Brant, Sparta	Beaver creek	3,000
Henry D. Baldwin, Sparta	La Crosse river	3,000
D. C. Beffe, Sparta	Silver creek	3,000
Geo. M. Willgrubs, Cashton	North Branch of Brush river.	3,000
R. R. Lucil, Cashton	Brush creek	3,000
Henry Hanson, Cashton	Wirchman creek	3,000
L. J. Engerbretsen, Cashton	Heiser's creek	3,000
R. L. Gillette, Warrens	Sand creek	3,000
Chas. Todd, Wilton	Breecher and Sinks creek	6,000
F. G. Warren, Warrens	Clear creek	6,000
Simon Vieregge, Norwalk	Moore's creek	3,000
C. F. Horning, Norwalk	Boedler creek	3,000
W. C. Drier, Norwalk	Drier's creek	3,000
J. P. Andres, Norwalk	Branch of Morris creek	3,000
E. McGary, Norwalk	Morris creek	3,000
S. Sloggy, Ontario	Billings and Cook creeks	6,000
		96,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
ONEIDA COUNTY—		
Chas. Lattimore, Woodruff	Ramer creek	3,000
A. E. Doolittle, Woodruff	Upper Trout creek	6,000
Thomas Hill, Woodruff	Trib. Allequah creek	3,000
C. J. Coon, Woodruff	Spring creek	6,000
Henry Coon, Woodruff	Allequah creek	6,000
W. A. Lucia, Woodruff	Ramer creek	6,000
John J. Reardon, Rhinelander	Wilson creek	6,000
E. C. Kretlow, Wausau	Trib. to Horsehead lake	6,000
		42,000
OUTAGAMIE COUNTY—		
L. Dabarener, Hortonville	Branch Black Otter creek	3,000
P. E. Diestler, Hortonville	Black Otter creek	3,000
Otto Diestler, Hortonville	Black Otter creek	3,000
		9,000
PEPIN COUNTY—		
Thomas F. Lucas, Durand	Little Bear creek	2,000
John J. King, Durand	Porcupine creek	2,000
James Preston, Durand	Stanton creek	2,000
Chas. W. Slumpf, Durand	Spring creek	2,000
Burr R. Tarrant, Durand	Fourth Branch, Fall creek	2,000
Wm. B. Smith, Durand	Norwegian creek	2,000
W. E. Barker, Durand		2,000
H. D. Nicklas, Durand	Dicham creek	2,000
G. S. Peck, Durand	Allison creek	2,000
Edw. Schruth, Pepin	Lost creek	3,000
August Thies, Pepin	Roaring river	3,000
Albert Schruth, Pepin	Little Plum	3,000
Wm. Engel, Pepin	Elks creek	3,000
C. J. Thies, Pepin	Lost creek	3,000
		33,000
PIERCE COUNTY—		
J. R. Adams, River Falls	Kinnickinnic river	3,000
H. J. Scheik, River Falls	Hornet creek	3,000
Rod S. William, River Falls	Timberlake creek	3,000
C. R. Taggart, River Falls	South Fork Kinnickinnic river	3,000
Warren H. Knowles, River Falls	South Fork Kinnickinnic river	3,000
E. A. Tobey, River Falls	Trimbelle creek	6,000
J. L. Tabor, Ellsworth	Trimbelle creek and Tribs.	3,000
John T. Beddall, Ellsworth	Trimbelle creek and Tribs.	3,000
W. S. Colburn, Ellsworth	Trimbelle creek	3,000
E. W. Walsingham, Ellsworth	Cave creek	3,000
W. W. Walsingham, Ellsworth	Rush creek	3,000
Chas. Staff, Prescott	Big River	6,000
S. F. Fansler, Maiden Rock	Rush Coulee and Fox Spring creeks	6,000
A. F. Herold, Maiden Rock	Pine and Davies creeks	3,000
John B. Carson, Maiden Rock	Spring Rivulet	3,000
W. C. Owen, Maiden Rock	Rush river	9,000
H. A. Benson, Maiden Rock	Fuller creek	3,000
H. R. Huber, Ellsworth	Brush creek	3,000
A. Combacher, Ellsworth	Trimbelle creek	3,000
		72,000
POLK COUNTY—		
B. Grimes, Clear Lake	Willow river	3,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
PORTAGE COUNTY—		
John C. Frost, Stevens Point	Drainage creek	4,000
M. S. Murat, Amherst	Waupaca river	2,000
M. A. Fleming, Amherst	Steadman river	2,000
Benj. Fleming, Amherst	Steadman river	2,000
O. J. Een, Amherst	S. and W. Branch creek	2,000
Lewis Williams, Amherst	Rollefson creek	2,000
Louis J. Olson, Scandinavia	Spring creek	4,000
J. S. Loberg, Nelsonville	Waupaca river	4,000
F. G. Ball, Stevens Point	Little Plover river	3,000
G. L. Park, Stevens Point	Little Plover river	3,000
W. L. Bronson, Stevens Point	Little Plover river	3,000
And. Klug, Stevens Point	Little Plover river	3,000
E. Viertel, Stevens Point	Big Plover river	3,000
A. C. Krembs, Stevens Point	Springville creek	3,000
L. P. Moen, Nelsonville	To-morrow river	3,000
		43,000
PRICE COUNTY—		
Patterson Bros., Fifield	Gurlaw creek	6,000
F. K. Randall, Phillips	Lovell creek	3,000
W. P. Sperry, Phillips	Frank and Wilson creeks	3,000
E. V. Covey, Phillips	Little and Big Elk rivers	3,000
H. R. Soulen, Phillips	Little Elk river	6,000
C. A. Lovell, Phillips	Crain and Chase creeks	3,000
		24,000
RICHLAND COUNTY—		
Jas. Hansel, Hub City	Melancthon creek	4,000
H. A. Householder, Bloom City	West branch Pine river	4,000
J. H. Frazier, Viola	Camp and Bear creeks	6,000
		14,000
ST. CROIX COUNTY—		
Clarence Fenton, Glenwood	Beavers creek	3,000
R. A. Cleveland, Glenwood	John's creek	3,000
P. A. Beefe, Glenwood	Blues creek	3,000
L. J. Adgate, Cylon	South Fork Willow river	3,000
Jno. F. McNamara, Cylon	Henry and Dufva creeks	3,000
Jas. O'Donnell, Cylon	Hutton creek	3,000
S. C. Boardman, New Richmond	Ten-mile creek	6,000
V. W. Mosher, New Richmond	Ten-mile creek	3,000
J. C. Harding, Hudson	Underwood springs	3,000
Phil. Samelson, Hudson	Willow river	3,000
H. C. Kurrasch, Hudson	Willow river and branches	3,000
F. F. Gray, Hudson	Hennesy creek	3,000
C. Reitdorf, Hudson	Willow river and branches	3,000
F. J. Carr, Hudson	Ten-mile creek	3,000
B. C. Bunker, Hudson	Ten-mile creek	3,000
		48,000
SAUK COUNTY—		
B. D. Sherwood, Spring Green	Bear creek	4,000
Wm. Davidson, Spring Green	Graham creek	4,000
F. B. Simpson, Spring Green	Jones creek	4,000
H. G. Clizbe, Reedsburg	Copper creek	3,000
W. I. Giffert, Reedsburg	Copper creek	3,000
E. G. Stolte, Reedsburg	Brown creek	3,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
SAUK COUNTY—Continued.		
H. C. Huebring, Reedsburg	Twin and Thompson creeks	3,000
Wilber Cahoon, Baraboo	Skillet creek	6,000
L. D. Horstman, Baraboo	Draper creek	3,000
F. E. Settergreen, Baraboo	Otter creek	3,000
E. G. Marriott, Baraboo	Big Spring creek	3,000
		39,000
SHAWANO COUNTY—		
B. B. Andres Jr., Birnamwood	Madison creek	6,000
H. F. Jahnke, Wittenberg	North Branch Embarrass river	6,000
J. Lehman & Son, Tigerton	North Branch Embarrass river	6,000
John Hoffman, Tigerton	Tiger creek	6,000
		24,000
SHEBOYGAN COUNTY—		
Geo. L. Nohl, Sheboygan Falls	Otter-tail creek	2,000
John Dinks, Plymouth	Hahn's creek	2,000
Wm. Maurer, Plymouth	Otter creek	2,000
O. Vocciliting, Sheboygan Falls	Klemmes creek	2,000
H. G. Gruebner, Sheboygan	Head of Onion river	4,000
		12,000
TAYLOR COUNTY—		
F. M. Sigel, Whittlesey	Mahners creek	3,000
A. Sorenson, Whittlesey	Mink creek	6,000
E. W. Watson, Medford	Ames creek	3,000
Louis Lupinsky, Medford	Rib river	3,000
W. E. Hibbard, Medford	Mink creek	3,000
Albert Bossard, Medford	Rib river	3,000
Dr. C. E. Nystrum, Medford	Ames creek	3,000
E. D. Simerson, Medford	Mink creek	3,000
		27,000
TREMPEALEAU COUNTY—		
A. S. Crow, Strum	Beaver creek	2,000
Louis E. Hanson, Strum	Big creek	2,000
H. P. Williams, Strum	Hogue creek	4,000
John Stillman, Osseo	Gates creek	4,000
Aich Crow, Osseo	North Branch Beef river	4,000
John Crow, Osseo	King creek	2,000
Frank Ruth, Arcadia	Travis Valley creek	2,000
J. C. Muir, Arcadia	Montana creek	2,000
J. T. Haines, Arcadia	Bishop creek	2,000
John Cain, Arcadia	Cowie creek	2,000
Jas. Shaffer, Arcadia	Story brook	2,000
E. A. Kersting, Arcadia	Trout run and Fenner Valley creeks	4,000
C. B. Miller, Arcadia	Eagle and Keller creeks	2,000
G. N. Hildershide, Arcadia	Traverse creek	2,000
Dr. J. M. Smithe, Whitehall	Fly creek	2,000
M. T. Elstad, Whitehall	South Elk creek	2,000
And. Bensend, Whitehall	Fly creek	2,000
John Hager, Whitehall	Irwin creek	4,000
R. S. Cowie, Whitehall	Crystal and North Valley creeks	4,000
W. S. Kidder, Whitehall	American Valley creek	2,000
Geo. O. Hansen, Independence	Borst Valley creek	2,000
Walter E. Sprecher, Independence	Little Elk creek	2,000
Anton Senty, Independence	Chimney Rock creek	2,000
Emil Huslegard, Independence	Borst Valley creek	2,000
Jacob Shaffner, Independence	Plum creek	2,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
TREMPEALEAU COUNTY—Continued.		
Harold Garthus, Independence	Traverse Valley creek	2,000
Will Lambert, Independence	Strum creek	2,000
Jacob Johnson, Independence	Traverse creek	2,000
T. H. Bodom, Blair	Trump creek	2,000
O. B. Borsheim, Blair	Vosse creek	2,000
O. C. Olson, Blair	Bear creek	2,000
G. C. Shepard, Blair	Vosse creek	2,000
E. L. Immell, Blair	Valley creek	2,000
B. W. Davis, Galesville	Bear creek and Tribs.	3,000
H. F. Clausen, Frenchville	French creek	3,000
H. Konig, Galesville	Grant creek	3,000
E. Gardner, Galesville	Silver creek	3,000
J. A. Kellman, Galesville	Beaver creek	3,000
W. S. Wadleigh, Galesville	Dutch creek	3,000
Albert Pederson, Etterick	Beaver creek	3,000
Oll. G. Herried, Etterich	Beaver creek	3,000
		102,000
VERNON COUNTY—		
Leon I. Johnson, Westby	Esofea creek	3,000
P. J. Hange, Westby	Branch-Timber-coulee creek	3,000
C. T. Shannon, Westby	Spring Valley creek	3,000
C. O. Johnson, Westby	Seas branch	3,000
A. H. Dahl, Westby	Skaaland creek	3,000
S. B. Reque, Westby	Timber Valley creek	3,000
H. A. Nerison, Westby	Springdale creek	3,000
J. K. Schreiner, Westby	Head of Kickapoo river	3,000
Matt Guion, Hillsboro	Guion creek	3,000
A. D. Calkins, Hillsboro	Trippville brook	3,000
R. Hammer, Hillsboro	South Fork Baraboo river	3,000
F. A. Wopat, Dilly	Head of Baraboo river	3,000
Jarvie Thompson, Hillsboro	Prairie creek	3,000
John W. Waddell, La Farge	Kickapoo river	3,000
J. I. Esch, Rockton	Kickapoo river	6,000
Geo. E. Tate, La Farge	Lima creek	3,000
Chas. W. Moore, La Farge	Jug creek	6,000
G. W. Henika, Readstown	Harrison Valley	3,000
Oscar Anderson, Readstown	Anderson creek	3,000
Julius Simm, Readstown	Miathum creek	3,000
D. D. Buxton, Readstown	Elk creek	3,000
M. S. Frazier, Readstown	Day creek	3,000
		72,000
VILAS COUNTY—		
Jas. Burns, Eagle River	Hay-meadow creek	3,000
C. W. Rogers, Eagle River	Little Deer-skin creeek	3,000
A. K. Everett, Eagle River	Mud creek	6,000
Ed. Lacon, Eagle River	Deerskin creek	6,000
C. H. Blohm, Conover	Tamarac creek	6,000
D. H. Sargent, Lakota	Muskrat creek	3,000
George Shelley, Lakota	Muskrat creek	6,000
Julius Strelow, Lakota	Muskrat creek	3,000
H. G. Frank, State Line	Cedar creek	3,000
Louis L. Thomas, State Line	Hay-meadow creek	6,000
B. F. Wilson, Star Lake	Manitowish creek	3,000
B. J. Vaughn, Star Lake	North Branch, Hunter's creek	3,000
H. C. Simonds, Star Lake	Garland creek	3,000
H. E. Salsich, Star Lake	Camp Thirteen creek	3,000
Edw. Parker, Star Lake	Star Lake creek	3,000
M. E. Murphy, Star Lake	Garland creek	3,000
Chas. Law Jr., Star Lake	Rice Lake creek	3,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
VILAS COUNTY—Continued.		
R. C. Aylward, Star Lake	Lost creek	3,000
Peter J. Reis, Arbor Vitae	Cedar creek	6,000
Frank M. Ward, Arbor Vitae	Willow river	3,000
Jos. H. Martin, Arbor Vitae	Martin creek	3,000
Julius Straunch, Arbor Vitae	Sand creek	3,000
Chas. H. Kamke, Arbor Vitae	Plum creek	3,000
John Eschenfauch, Arbor Vitae	Mud creek	3,000
S. B. Bissell, Arbor Vitae	Martin creek	3,000
A. P. Brown, Minocqua	Nameless creek	6,000
H. H. Ober, Minocqua	McGregor creek	6,000
		105,000
WALWORTH COUNTY—		
Shirley McDougal, Whitewater	Bluff creek	4,000
Edwin McDougal, Whitewater	Whitewater creek	4,000
C. B. Alrick, Whitewater	Territorial creek	4,000
J. A. Collin, Delavan	Spring creek	4,000
		16,000
WASHBURN COUNTY—		
C. J. Stover, Shell Lake	Beaver brook	3,000
M. J. Carey, Shell Lake	Montgomery brook	3,000
Forest Lovell, Shell Lake	Bear creek	3,000
A. A. Lovell, Shell Lake	Arbuckle brook	3,000
Barney Mullin, Shell Lake	Spring creek	3,000
Andrew Ryan, Shell Lake	Silver spring	3,000
		18,000
WAUKESHA COUNTY—		
G. R. Rice, North Prairie	White creek	4,000
Jas. P. Donlan, Eagle	Bottomry creek	4,000
W. H. Tuohy, Eagle	Spring creek	4,000
L. J. Stone, Oconomowoc	Waterville creek	4,000
C. J. Shaver, Oconomowoc	Oconomowoc creek	4,000
		20,000
WAUPACA COUNTY—		
I. L. Passmore, Iola	Branch of Iola creek	2,000
Geo. Johnson, Iola	Mars creek	2,000
J. C. Lang, Iola	South branch of Little Wolf river	2,000
Geo. E. Lindow, Iola	South branch of Little Wolf river	2,000
M. S. Strand, Symco	Blake brook	4,000
Magnus Bryterson, Scandinavia	Hayward creek	4,000
A. G. Anderson, Scandinavia	Rollofson creek	4,000
Edw. E. Browne, Waupaca	Emmons creek	10,000
Junior Mumbrue, Waupaca	Radley creek	4,000
M. T. Allen, Waupaca	Allen creek	6,000
Jacob Bentz, Clintonville	Knap creek	3,000
C. H. Meisner, Clintonville	Hyde creek	3,000
		46,000
WAUSHARA COUNTY—		
W. J. Smith, Plainfield	Iron creek	4,000
P. J. Bresnahan, Plainfield	North Ten-mile creek	2,000
C. H. Pratt, Plainfield	Ten-mile creek	2,000
Geo. Gustin, Plainfield	Ten-mile creek	4,000
H. G. Robinson, Hancock	Chaffe creek	2,000
M. M. Steele, Hancock	Chaffe creek	2,000
F. E. Dommie, Hancock	Little Rochacris creek	2,000
Almon Gardiner, Hancock	White river	2,000

TROUT PONDS IN PROCESS OF CONSTRUCTION, WILD ROSE.

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
WAUSHARA COUNTY—Continued.		
W. A. Wright, Hancock	Little Rochacris creek	2,000
C. A. Patterson, Hancock	Rochacris creek	2,000
G. N. Spaulding, Hancock	Big Rochacris creek	2,000
Ed. O'Connor, Hancock	Little Rochacris creek	2,000
Herman Miller, Dakota	Mecan river	4,000
A. O. Borst, Richford	Mecan river	4,000
John Shorey, Coloma Station	Peetwood creek	2,000
Wm. Smith, Coloma Station	Weede creek	2,000
Jas. Parkin, Coloma Station	Weede creek	2,000
J. R. McLaughlin, Coloma Station	Lynch creek	2,000
Edd. Preno, Coloma Station	Chaffe creek	2,000
J. T. King, Coloma Station	Pine creek	2,000
C. E. Wells, Auroraville	Cedar creek	4,000
Spencer Bowen, Auroraville	Willow creek	2,000
A. L. Grimes, Auroraville	Willow creek	2,000
M. L. Bowen, Auroraville	Willow creek	2,000
H. O. Arenson, Wautoma	Spring brook	2,000
W. L. Roberts, Wautoma	White river	2,000
E. J. Walker, Wautoma	White river	2,000
W. H. Berry, Wautoma	White river	2,000
A. G. Holt, Wautoma	Hoxie creek	2,000
C. D. Bandizen, Wautoma	Soule creek	2,000
John M. Koesser, Red Granite	Red Granite creek	10,000
A. J. Stevens, Wild Rose	Pine river	2,000
J. V. Berens, Wild Rose	Pine river	2,000
R. H. Jones, Wild Rose	Head Pine river	2,000
Henry Holt, Wild Rose	Willow creek	2,000
E. J. Hughes, Wild Rose	Pine river	4,000
Ed. Humphrey, Wild Rose	Branch Pine river	4,000
G. H. Fuller, Spring Lake	Spring Lake outlet	4,000
John Magdang, Pine River	Coon-marsh creek	4,000
		104,000
WOOD COUNTY—		
Wm. A. Cole, Vesper	Spring creek	6,000
John Schmitt, Marshfield	Stregee creek	3,000
John Brochendorf, Marshfield	Rocky run creek	3,000
Jacob Milkelm, Marshfield	Summers creek	3,000
Louis Thompson, Marshfield	Rocky run creek	3,000
Karl Mess, Marshfield	Summers creek	3,000
Capt. Youngchild, Nekoosa	Nutter creek	6,000
D. B. Philleo, Grand Rapids	Seven-mile creek	6,000
H. C. Demitz, Grand Rapids	Two-mile creek	3,000
A. G. Miller, Grand Rapids	Wakeley creek	3,000
Edw. Spoffard, Grand Rapids	Lin creek	3,000
B. J. Closent, Grand Rapids	Seven-mile creek	3,000
J. Lutz, Grand Rapids	Railroad creek	3,000
		48,000
Total brook trout, advanced fry,	planted, 1907.	1,980,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1907.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
ADAMS COUNTY—		
John Roembach, Kilbourn	Corning creek	4,500
A. S. Waterman, Kilbourn	Waterman creek	3,000
A. P. Fish, Kilbourn	Burdick creek	3,000
		10,500
ASHLAND COUNTY—		
Theo. R. Yankee, Butternut	Spillie creek	6,000
Herman Buechner, Butternut	Beaver creek	3,000
John Meyers, Butternut	Spillie creek	3,000
Frank Kleinsteiber, Butternut	Butternut creek	3,000
William Schafer, Glidden	Magee creek	3,000
Mike Carey, Glidden	Augustin creek	1,500
O. H. Kaufman, Glidden	Head of East Fork of Chippewa river	1,500
Dan Barney, Glidden	Tyler creek	1,500
Henry Schroeder, Glidden	Magee creek	1,500
Walter Sell, Glidden	Creek in Sec. 32, T. 42, R. 1 East	1,500
G. H. Kern, Glidden	Head of East Fork of Chippewa river	1,500
George Sell, Glidden	Tyler creek	3,000
C. P. Peck, Mellen	Tyler Fork	3,000
J. Steffeck, Mellen	Devils creek	9,000
Lautz Parns, Mellen	Devils creek	3,000
Geo. H. Buchanan, Ashland	Tributary of Fish creek	30,000
		75,000
BARRON COUNTY—		
A. A. Haffie, Chetek	Ten-mile creek	6,000
Ed. Field, Rice Lake	Little Bear creek	6,000
C. G. Bannister, Rice Lake	Cobb creek	3,000
J. H. Wilz, Rice Lake	Yellow river	3,000
Joe Scharbilling, Rice Lake	Hicky creek	3,000
J. J. Moe, Rice Lake	Little Bear creek	3,000
H. F. Boortz, Rice Lake	Little Bear creek	3,000
Guy Dick, Hillsdale	Upper Pine creek	6,000
H. W. Carr, Hillsdale	Upper Pine creek	6,000
Oscar Anderson, Dallas	North Pine creek	3,000
Sofus Moe, Dallas	Doe creek	3,000
Harry Halvorson, Dallas	North Sioux creek	3,000
E. A. Pelton, Dallas	North Sioux creek	3,000
George Kellar, Dallas	South Pine creek	3,000
D. A. Russell, Dallas	Gourn creek	3,000
Frank Dorey, Dallas	West Branch of South Pine creek	3,000
A. J. Osborne, Barron	Little Jump river	6,000
F. B. Kinsley, Barron	Doherty creek	6,000
D. J. Borum, Barron	Barker creek	6,000
Geo. R. Borum, Barron	Quarder creek	6,000
T. W. Borum, Barron	Johnson creek	9,000
Geo. Post, Barron	Miller creek	9,000
H. C. Berg, Barron	Hicky creek	9,000
D. D. Page, Barron	Miller creek	9,000
		120,000
BAYFIELD COUNTY—		
Fred Nemec, Cable	Big brook	6,000
Albert Nemec, Cable	Capt. Garrison creek	6,000
A. H. Miles, Iron River	Iron river	6,000
H. O. Lund, Iron River	Tributaries of Iron river	6,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
BAYFIELD COUNTY—Continued.		
H. H. Jewett, Iron River	Muskeg river	6,000
Gust Headquist, Iron River	Iron river	6,000
G. H. Buchanan, Ashland	Readys creek	6,000
C. W. Hines, Ashland	Readys creek	6,000
Ed. Shiplid, Ashland	Little Pine creek	6,000
		54,000
BROWN COUNTY—		
Rowland T. Burdon, Green Bay	Syrills creek	3,000
H. D. Van Seggern, Fontenoy	Neshotah river	4,500
H. F. Buckmann, Green Bay	Neshotah river	4,500
John Grass, Green Bay	Branch river	4,500
Elmer S. Hall, Green Bay	Beaver Dam creek	3,000
John A. Kittle, Green Bay	Kittle creek	3,000
John J. Hoff, Sobieski	Little Suamico river	4,500
W. E. Burdeau, Tremble	Suamico river	6,000
F. E. Burke, Greenleaf	Branch river	9,000
		42,000
BUFFALO COUNTY—		
W. A. Parker, Mondovi	Rock creek	7,500
John S. Hayes, Mondovi	Creek number 15	7,500
		15,000
BURNETTE COUNTY—		
E. P. Buck, Grantsburg	North Fork Wood river	3,000
August Anderson, Grantsburg	North Fork Wood river	3,000
C. A. Greene, Grantsburg	Hay creek	3,000
Bert Hickerson, Grantsburg	Wood river	1,500
N. Hickerson, Grantsburg	Wood river	1,500
P. D. Hickerson, Grantsburg	Wood river	1,500
Ensley Hickerson, Grantsburg	Wood river	1,500
		15,000
CALUMET COUNTY—		
Anton Groschel, Chilton	Manitowoc river	3,000
Frank Wagner, Chilton	Mill creek	3,000
Geo. Woelfel, Hayton	Tributary Manitowoc river	3,000
		9,000
CHIPPEWA COUNTY—		
Casper A. Krupp, Boyd	Lutz creek	3,000
C. S. Little, Stanley	Tapel river	3,000
Ben Dietrich, Cadott	Paint creek	3,000
Joe Dietrich, Cadott	Paint creek	3,000
Chas. Marriner, Cadott	Little Drywood creek	3,000
L. P. Stevens, Bloomer	West Fork Duncan creek	3,000
L. L. Thayer, Bloomer	O'Neil creek	6,000
E. C. Fox, Bloomer	McCann creek	3,000
J. G. Prucher, Bloomer	Duncan creek	3,000
Jas. A. Hogan, Bloomer	Conory, Pine and Jove creeks	3,000
A. T. Newman, Bloomer	Sand creek	3,000
R. W. Hendry, Chippewa Falls	Paint and Little Paint creeks	6,000
		42,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
CLARK COUNTY—		
S. J. Barrett, Neillsville	Cawley creek	3,000
Hugh Barrett, Neillsville	Cawley creek	3,000
Geo. K. Redmond, Neillsville	O'Neil creek	1,500
Wm. Heaslett, Neillsville	O'Neil creek	1,500
M. D. Garrison, Thorp	Briggs creek	3,000
		12,000
COLUMBIA COUNTY—		
J. M. Bushnell, Wyocena	South Branch of Dutch creek	3,000
Dan Bentley, Poynette	Rocky run	1,500
Frank Moran, Portage	Smith creek	3,000
Tony Klennert, Portage	Little Neenah creek	1,500
W. P. Ketchum, Portage	O'Keefe creek	3,000
H. W. MacKenzie, Poynette	Poynette creek	3,000
E. Hinkson, Poynette	Hinkson creek	3,000
Dr. S. F. Verbeck, Lodi	Spring creek and Branches	3,000
J. Frank Collin, Lodi	Okee Mill Pond	1,500
		22,500
CRAWFORD COUNTY—		
Geo. H. Davidson, Soldiers Grove	Kickapoo river	15,000
DANE COUNTY—		
C. A. Hanan, Oregon	Badfish creek	3,000
E. S. Bennett, Belleville	East Marsh creek	3,000
Joness Berg, Belleville	Holmes creek	3,000
Henry Ross, Belleville	Girard creek	3,000
		12,000
DODGE COUNTY—		
C. H. Harvey, Beaver Dam	Crystal lake	3,000
Frank S. Bauer, Knowles	Tributary of Rock river	4,500
Geo. M. Bagley, Neosho	Neosho pond	3,000
		10,500
DOUGLAS COUNTY—		
Jos. Lucius, Brule	Mud creek	24,000
Nels Carlson, Brule	Rocky run	6,000
Chas. J. Daniels, Poplar	Poplar river	6,000
A. N. Anderberg, Poplar	Poplar river	6,000
		42,000
DUNN COUNTY—		
Wm. P. Unser, Eau Galle	Eau Galle river	1,500
B. E. Graves, Eau Galle	Eau Galle pond	1,500
Geo. P. Topliss, Eau Galle	Eau Galle river	1,500
P. H. Daugherty, Eau Galle	Little Missouri river	1,500
H. Heath, Eau Galle	Eau Galle river	1,500
Ed. Wilson, Eau Galle	Eau Galle river	1,500
E. Baker, Wheeler	Little Otter	3,000
J. D. Boobar, Colfax	Broken creek	3,000
G. F. Martin, Colfax	Broken creek	1,500
		16,500

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
EAU CLAIRE COUNTY—		
P. J. Quart, Fall Creek	Fall creek	3,000
S. A. Russell, Fall Creek	Beaver creek	3,000
Chas. Stiding, Altoona	Seven-mile creek	1,500
W. T. Duganne, Altoona	Otter creek	3,000
W. H. Hawker, Altoona	Otter creek	1,500
L. A. McKinley, Altoona	Otter creek	1,500
W. L. Botsford, Altoona	Otter creek	3,000
Chas. F. Winslow, Eau Claire	Rock creek	4,500
J. T. Joyce, Eau Claire	Trout brook	3,000
A. J. Klofanda, Eau Claire	Chippewa river and pond	3,000
Leopold Kortsch, Eau Claire	Otter creek and pond	3,000
		30,000
FLORENCE COUNTY—		
Mrs. C. Hanson, Florence	Keyes and Loon lakes	3,000
Ignace Schneider, Iron Mountain	Little Popple river	6,000
		9,000
FOND DU LAC COUNTY—		
C. H. Fischer, Ripon	Dakin creek	1,500
A. B. Carter, Ripon	Dakin creek	1,500
Jas. L. Stone, Ripon	Roy creek	1,500
A. L. Luek, Ripon	Snake creek	1,500
Harry Cody, Ripon	Wakefield creek	3,000
E. G. Tuledge, Oakfield	Head Fond du Lac river	3,000
W. F. Sommerfield, Oakfield	Upper Branch Fond du Lac river	3,000
Al. Lander, Fond du Lac	Parson creek	1,500
J. H. Ridgway, Fond du Lac	Byron creek	1,500
L. J. Justen, Fond du Lac	Mulvey creek	1,500
Arthur Serasse, Fond du Lac	Byron creek	1,500
A. W. Daugherty, Fond du Lac	Parsons creek	1,500
Alex Marcoe, Fond du Lac	Camp-ground creek	1,500
H. S. Miller, Fond du Lac	Camp-ground creek	3,000
		27,000
FOREST COUNTY—		
D. W. Connor, Laona	Silver lake	3,000
W. D. Connor, Laona	Three-spring creek	3,000
Connor Lbr. & Land Co., Laona	Tributaries to Rat river	3,000
Joseph Martin, Laona	Tributaries to Rat river	3,000
R. S. Elliott, Laona	Tributaries to Rat river	1,500
Chet Starks, Laona	Tributaries to Rat river	1,500
Connor Lbr. & Land Co., Laona	Tributaries to Rat river	9,000
		24,000
GRANT COUNTY—		
John W. Brackett, Lancaster	Austin Branch	3,000
John Decker, Lancaster	Borah Branch	1,500
Fred Day, Lancaster	Little Grant river	1,500
Arno. L. Alt, Lancaster	Day Branch	1,500
Lou Starr, Lancaster	Walker Branch	1,500
Will Mullen, Lancaster	McPherson Branch	1,500
John Buben, Fennimore	Coon Branch	3,000
R. C. Livingston, Livingston	Martinville Branch of Platte river	3,000
Henry F. Schmitt, Livingston	Martinville creek	3,000
Theodore Huppler, Muscoda	Coon Branch	3,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
GRANT COUNTY—Continued.		
O. W. Fessel, Muscoda	Sand Branch	3,000
John O. Postel, Muscoda	Ludvig Branch	3,000
Geo. Mertz, Boscobel	Crooked creek	3,000
F. C. Lewis, Bridgeport	Hollow creek	3,000
Fred Foster, Woodman	Willow creek	3,000
		37,500
GREEN COUNTY—		
Frank Vance, Brodhead	Sugar river and Tributaries..	4,500
Matt Salbraa, New Glarus	Sugar river and Tributaries..	3,000
D. H. Morgan, Albany	Sugar river and Tributaries..	3,000
		10,500
IOWA COUNTY—		
Fred Jewell, Dodgeville	Pristomie creek	3,000
Wm. N. Mills, Dodgeville	Pedlam creek	3,000
A. Appel, Mineral Point	Lynch stream	4,500
T. M. Priesttey, Mineral Point	McKinneys stream	4,500
J. M. Mulharin, Mineral Point	Lynch stream	3,000
Jesse L. Teague, Waldwick	Prices Branch	3,000
F. P. Emyton, Jonesdale	Yellowstone creek	3,000
Chas. Egan, Highland	Otter creek and Tributaries..	10,500
		34,500
IRON COUNTY—		
J. C. Withington, Mercer	Turtle river	3,000
Henry Meade, Hurley	Trout creek	1,500
J. H. Hawker, Hurley	Spring creek	3,000
M. J. Connors, Hurley	West Branch Montreal river..	3,000
Geo. C. Foster, Hurley	Montreal river	3,000
		13,500
JACKSON COUNTY—		
Gay R. Sechler, Sechleville	Sly creek	1,500
E. E. Moore, Merrillan	Mill pond	3,000
David Gaylord, Merrillan	Arnold creek	3,000
		7,500
JEFFERSON COUNTY—		
Albert Schaller, Waterloo	Manasha creek	3,000
JUNEAU COUNTY—		
James Nevin, Lyndon Station	Lyndon and Seven-mile creeks	3,000
Cecil J. Phillips, Camp Douglas	Little Lemonweir river	3,000
Lester L. Millard, Elroy	Head of Baraboo river	6,000
R. C. Falconer, Camp Douglas	Hoton creek	6,000
C. A. Leicht, New Lisbon	Smith creek	6,000
		24,000
KEWAUNEE COUNTY—		
Anton Defuch, Casco	Decker creek	3,000
John Barta, Casco	Decker creek	3,000
J. H. Rooney, Casco	Little Scarbora river	3,000
Jas. Musil, Clyde	Little Scarbora river	3,000
		12,000
LA CROSSE COUNTY—		
Casper Anderegg, La Crosse	Mormon Coulee creek	6,000
A. Hirshhiemer, La Crosse	North Branch Coon creek	6,000
		12,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
LAFAYETTE COUNTY—		
M. P. Kennedy, Gratiot	Trout brook	3,000
L. A. Hazeltine, Argyle	Brazel creek	3,000
John W. Mitchell, Argyle	Brazel creek	3,000
A. A. Strommen, Blanchardville	Strommen creek	1,500
Anton A. Strommen, Blanchardville	Yankee Hollow creek	1,500
H. D. Thomas, Blanchardville	Yellowstone creek	1,500
George Gould, Blanchardville	Rob creek	1,500
W. E. Robinson, Blanchardville	Rob creek	1,500
Jas. Blanchard, Blanchardville	McKenna creek	1,500
		18,000
LANGLADE COUNTY—		
Charles Schotte, Antigo	Eau Claire river	3,000
Theo. Lenzner, Kempster	Donhue lake	3,000
John Kaufman, Pholx	Red river	6,000
		12,000
MANITOWOC COUNTY—		
S. W. Randolph, Manitowoc	Schisles, English and Lutskys lakes	15,000
Albert Arens, Maribel	West Twin river	3,000
Anton Reif, Whitelaw	Branch river	3,000
John Reznickeck, Whitelaw	Branch river	3,000
		24,000
MARATHON COUNTY—		
A. W. Whiting, Marathon	Scotch creek	1,500
H. A. Fricke, Marathon	Big Rib river	1,500
John Simsen, Marathon	Scotch creek	1,500
A. Schneiders, Marathon	Scotch creek	1,500
W. Schmidt, Marathon	Scotch creek	1,500
Fred Prehn, Marathon	Scotch creek	1,500
August Hanneman, Edgar	Hanneman creek	3,000
		12,000
MARINETTE COUNTY—		
Phil S. Armstrong, Beaver	Main Beaver creek	4,500
E. Judson Baker, Marinette	Jud creek	6,000
A. F. Fairchild, Marinette	South Branch Pike creek	6,000
Harvey Englund, Pembine	Pembine creek	4,500
Edwin M. Slye, Pembine	Pembine creek and Tributaries	4,500
Chas. Stoveken, Pembine	Pembine river	3,000
J. R. Gravel, Pembine	Pembine river	3,000
James Moran, Wausaukee	Cold-water brook	6,000
Geo. H. Hartwell, Crivitz	Peterman brook	12,000
John Striffler, Marinette	Main Thunder river	13,000
A. F. Fairchild, Marinette	Main Thunder river	6,000
B. Gissenaas, Pound	South Branch Beaver river	6,000
Alex Charles, Pound	Bower creek	6,000
E. D. Galieau, Middle Inlet	Middle Inlet creek	7,500
James C. Morgan	Cold-water brook	6,000
John Underwood, Wausaukee	Little Wausaukee river	6,000
E. Judson Baker, Marinette	Thunder river and tributaries	9,000
And. Bolander, Amberg	South Pike river	6,000
C. J. Johnson, Marinette	West Branch Muscano river	3,000
Jas. Gravel, Pembine	Pembine creek	3,000
Chas. Stovekin, Pembine	Peminee Bom-Wom creek	3,000
Harvey Englund, Pembine	Tributary North Branch Pembine river	3,000
Edw. M. Slye, Pembine	Peminee creek and Tributaries	3,000
		130,500

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
MONROE COUNTY—		
J. A. Worden, Tomah	Council creek	3,000
Geo. P. Stevens, Tomah	Little Silver creek	3,000
John G. Schell, Norwalk	Spring Valley creek	1,500
M. O. Hefferman, Norwalk	Moor's creek	1,500
Carl Hanih, Norwalk	Head of Swamp creek	1,500
C. F. Horning, Norwalk	Boedker creek	1,500
Wm. Cuntz, Norwalk	Woodliff creek	1,500
Pete Christ, Norwalk	East Beaver creek	3,000
Wm. J. McCanee, Sparta	Moore's creek	4,500
S. Sloggy, Ontario	Cook and Billings creek	4,500
H. J. Werdon, Wilton	Slaton creek	3,000
R. S. Serrurier, Wilton	Dorset creek	3,000
H. C. Wagner, Wilton	Sinks creek	1,500
T. M. Mills, Wilton	Dorset creek	1,500
Geo. Yackel, Wilton	Kickapoo river	1,500
Her. Bartz, Wilton	Coal creek	1,500
H. H. Barker, Sparta	Beaver and Walrath creeks	30,000
		67,500
OCONTO COUNTY—		
John J. Hof, Sobieski	Little Suamico river	3,000
Herman Dick, Suring	South Branch Oconto river	6,000
A. Baker, Lakewood	North Branch Oconto river, Knoels and Battle creeks	15,000
		24,000
ONEIDA COUNTY—		
Houlton Bros., Woodruff	Trout lake	3,000
W. A. Lucia, Woodruff	Premor creek	3,000
Henry Coon, Woodruff	Allequah creek	3,000
C. J. Coon, Trout Lake	Trout lake	3,000
		12,000
PIERCE COUNTY—		
J. L. Tabor, Ellsworth	Trinbelle creek	1,500
John T. Beddall, Ellsworth	Trinbelle creek	1,500
E. W. Walsingham, Elssworth	Cave creek	1,500
Arthur Travis, Ellsworth	Rush river	1,500
Wilbur Travis, Ellsworth	Little Trinbelle creek	1,500
W. W. Walsingham, Ellsworth	Rush river	1,500
William J. Walters, Ellsworth	Spring brook	1,500
P. H. Isaacson, Ellsworth	Brush creek	1,500
J. A. Fresse, Ellsworth	Rush river	1,500
A. N. Kerr, Beldenville	Cave creek	1,500
L. H. Place, Ellsworth	Rush river	6,000
		21,000
PORTAGE COUNTY—		
L. A. Pomeroy, Amherst	To-morrow river	3,000
John C. Frost, Stevens Point	Drainage ditch	3,000
L. P. Moen, Stevens Point	Wisconsin river	6,000
Walter Eddy, Stevens Point	Little Plover river	3,000
Frank Gano, Stevens Point	Little Plover river	3,000
John C. Frost, Stevens Point	Drainage ditch	4,500
		22,500
PRICE COUNTY—		
R. M. Horr, Prentice	Jump river	3,000
C. W. Welch, Prentice	Little Molden river	3,000
W. H. Douglas, Prentice	Molden river	3,000
F. L. Hunt, Phillips	Little Elk river	6,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
PRICE COUNTY—Continued.		
F. K. Randall, Phillips	Squaw creek	3,000
E. V. Covey, Phillips	Big Elk river	3,000
Geo. F. Sciwell, Phillips	Mount Pike creek	3,000
J. E. Feely, Fifield	McKinzie creek	6,000
Patterson Bros., Fifield	Gunlau creek	6,000
		36,000
RACINE COUNTY—		
Albert Huse, Burlington	Honey creek and White river.	4,500
W. G. Bartholf, Burlington	Outlet of Ryan's lake	3,000
		7,500
RICHLAND COUNTY—		
Geo. W. Schroeder, Viola	Carry creek	3,000
J. H. Frazier, Viola	East and West Kickapoo river	3,000
		6,000
ST. CROIX COUNTY—		
S. L. Pickett, Wilson	Cohen creek	4,500
Decker Brothers, Woodville	Eau Galle river	3,000
Bert G. Stockman, Woodville	Eau Galle river	3,000
L. G. Green, Hudson	Willow river	1,500
S. W. Bandy, Hudson	Willow river	1,500
R. E. Hockgin, Hudson	Willow river	1,500
C. Reitdorf, Hudson	Willow river and branches	1,500
F. F. Gray, Hudson	Willow river	3,000
H. C. Kurrasch, No. Hudson	Willow river	3,000
J. C. Harding, Hudson	Underwood spring	3,000
Andrew Hope, Hammond	Willow river	3,000
John Pearson, Somerset	Apple river	3,000
B. T. Dean, Jewett Mills	O'Connell springs	3,000
Louis Haugen, Hudson	Willow river	3,000
Joseph Yoerg, Hudson	Willow river	3,000
B. C. Bunker, Hudson	Ten-mile creek	3,000
A. G. Anderson, Hudson	Willow river	6,000
J. C. Harding, Hudson	Underwood spring	3,000
		52,500
SAUK COUNTY—		
Arthur C. Ochner, Plain	Branch Honey creek	3,000
James L. Dalling, Baraboo	Otter or Barter creek	6,000
G. E. Dangle, Reedsburg	Dell creek	6,000
E. Blakeslee, Ironton	Carr Valley creek	3,000
J. P. Fitzgerald, Ironton	Carr Valley creek	3,000
F. E. Hawkins, Ironton	Crossman's creek	3,000
Geo. E. Talbot, Lime Ridge	Narrows creek	3,000
		27,000
SAWYER COUNTY—		
Mike Murphy, Hayward	Hay creek	6,000
G. A. Erickson, Hayward	Hay creek	6,000
C. B. Jorgenson, Hayward	Smith lake	6,000
Henry Horne, Hayward	Ayers and Huntley lake	6,000
P. W. Reiser, Couderay	Wind Fall creek	6,000
John H. Moyer, Couderay	Eddy creek	6,000
		36,000
SHAWANO COUNTY—		
M. R. Berendts, Caroline	Embarrass river	3,000
J. Lehmann & Son, Tigerton	Tiger creek	3,000
John Hoffman, Tigerton	North Branch	3,000
R. B. Glaubitz, Wittenberg	Middle Embarrass river	3,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
SHAWANO COUNTY—Continued.		
H. C. Wiskow, Wittenberg	Middle Embarrass river	3,000
Frank Hitzke, Wittenberg	Middle Embarrass river	3,000
Frank Kuschel, Wittenberg	Middle Embarrass river	3,000
Elwin Franklin, Jr., Eland Jct.	South Embarrass river	3,000
R. B. Glaubitz, Wittenberg	Middle Embarrass river	7,500
		31,500
SHEBOYGAN COUNTY—		
B. H. Sanford, Sheboygan Falls	Onion river	3,000
H. C. Gruebner, Sheboygan	North Branch Milwaukee river	6,000
Aug. Goetsch, Franklin	Sheboygan river creek	3,000
R. G. Arnold, Glenbeulah	Otter pond	3,000
H. C. Gruebner, Sheboygan	North Branch Milwaukee river	3,000
Chas. G. Peck, Sheboygan Falls	North Branch Milwaukee river	3,000
		21,000
TAYLOR COUNTY—		
John L. Larsen, Rib Lake	Spirit lake	3,000
Louis Supinsky, Medford	Rib river	1,500
W. E. Hibbard, Medford	Mink creek	3,000
Albert Bossard, Medford	Rib river	3,000
A. D. Simerson, Medford	Mink creek	3,000
John Wm. Kaye, Westboro	Silver creek	3,000
Frank M. Perry, Westboro	Silver creek	3,000
		19,500
TREMPEALEAU COUNTY—		
J. C. Muir, Arcadia	North creek	3,000
E. A. Kersting, Arcadia	Trout run and Simpson creek	7,500
W. P. De Bow, Blair	Trempealeau river	3,000
B. W. Davis, Galesville	Beaver creek	6,000
Dr. W. P. Mailer, Galesville	Grant and Tamarack creeks...	6,000
A. T. Brandon, Osseo	Nelson and Jernstad creeks...	15,000
		40,500
VERNON COUNTY—		
C. H. Carter, Readstown	Kickapoo river	3,000
E. B. Harkin, Hillsboro	Longer creek	1,500
A. D. Calkins, Hillsboro	Trippville creek	1,500
John Hainschick, Hillsboro	Hillsboro pond	1,500
R. Hammer, Hillsboro	South Fork Baraboo river	1,500
C. F. Knappman, Hillsboro	Greenwood creek	1,500
Matt Guion, Hillsboro	Guion creek	1,500
J. W. Curry, Valley	Tributaries Warner creek	3,000
Chas. Staley, Hillsboro	Branch Baraboo river	3,000
		18,000
VILAS COUNTY—		
Fred Morey, Eagle River	Deer-skin river	3,000
Geo. Muckler, Eagle River	Crystal lake	3,000
Jas. Burns, Eagle River	Deer-skin river	3,000
Edw. Lacon, Eagle River	Deer-skin river	3,000
W. J. Pinkerton, Eagle River	Wisconsin river	3,000
C. H. Blohm, Eagle River	Twin river	3,000
Fayette L. Buck, Divide	Turtle river	3,000
		21,000
WALWORTH COUNTY—		
J. H. Fryer, Whitewater	Whitewater creek	3,000
C. B. Alrich, Whitewater	Aurelian stream	3,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
WALWORTH COUNTY—Continued.		
H. E. Lindsay, Whitewater	Spring brook	3,000
H. D. Barnes, Elkhorn	Spring brook	3,000
J. A. Collin, Delavan	Turtle creek	3,000
		15,000
WASHBURN COUNTY—		
J. H. Bixby, Trego	Spring lake	6,000
Frank Kasper, Sarona	Trib. of Kasper lake	6,000
John A. Martin, Birchwood	Sucker creek	6,000
John Mikinlor, Birchwood	Chetac lake	6,000
W. F. Loomis, Birchwood	Sucker creek	6,000
W. H. Noyes, Birchwood	Pigeon creek	6,000
		36,000
WAUKESHA COUNTY—		
G. R. Rice, North Prairie	White creek	3,000
Jas. P. Donlan, Eagle	Bottomry creek	3,000
W. H. Tuohy, Eagle	Eagle and Spring creek	3,000
Chas. Benton, Oconomowoc	Waterville creek	3,000
F. W. Welch, Waukesha	Wrights creek	3,000
		15,000
WAUPACA COUNTY—		
George Johnson, Iola	Mars creek	3,000
J. E. Phillips, Iola	South Branch of Little Wolf river	3,000
Mangnus Brynteson, Scandinavia	Hayard creek	3,000
A. G. Anderson, Scandinavia	Rollofson creek	3,000
Chas. H. Anderson, Scandinavia	South Branch of Little Wolf river	3,000
Jos. Bentz, Clintonville	Hodge creek	3,000
M. T. Allen, Waupaca	Hartmans river	6,000
Edw. E. Browne, Waupaca	Waupaca river	9,000
B. L. Seeber, Sheridan	Waupaca river	1,500
H. W. Taylor, Sheridan	Waupaca river	1,500
P. C. Jensen, Sheridan	Waupaca river	1,500
G. B. Root, Sheridan	Waupaca river	1,500
John Durrant, Sheridan	Waupaca river	1,500
		40,500
WAUSHARA COUNTY—		
G. N. Spaulding, Hancock	White river	1,500
H. P. Walker, Hancock	Mecan river	1,500
Ed. O'Connor, Hancock	Mecan river	3,000
M. Lathrop, Hancock	Rochacris creek	1,500
L. W. Beach, Hancock	Spaulding creek	1,500
Willis Edson, Hancock	Rochacris creek	1,500
A. Hebblewhite, Hancock	Chaffee creek	1,500
Roy Parkin, Coloma	Tredham creek	6,000
O. E. Thompson, Wautoma	John's creek	3,000
C. E. Michaels, Wautoma	Soules creek	3,000
R. E. Ades, Wautoma	Mecan river	3,000
W. L. Roberts, Wautoma	Mecan river	1,500
		28,500
WOOD COUNTY—		
O. G. Lindemann, Marshfield	Spring stream	3,000
W. A. Cole, Vesper	Spring creek	3,000
		6,000
Total rainbow trout, advanced	fry, planted, 1907	1,558,500

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1907.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
ASHLAND COUNTY—		
Chas. Kleinsteiber, Butternut	Butternut lake	80,000
Frank Kleinsteiber, Butternut	Butternut lake	80,000
Wm. Lindemeyer, Butternut	Butternut lake	80,000
C. R. Goldsworthy, Vesper	Butternut lake	160,000
E. G. McAnulty, Butternut	Butternut lake	80,000
Ed. Meyers, Butternut	Butternut lake	80,000
John Meyers, Butternut	Butternut lake	80,000
E. B. Gordon, Glidden	Gordon lake	80,000
Robert Augustin, Glidden	Fiedler lake	80,000
Edgar W. Gordon, Glidden	Gordon Lake	80,000
L. E. Gordon, Glidden	Lake in Sec. 32, T. 43, R. 2.	80,000
Andy Wood, Glidden	Lake Summit	80,000
A. J. Sullivan, Mellen	Herbert's lake	80,000
A. C. Poundstone, Mellen	Duck and Spider lakes	80,000
C. F. Peterson, Mellen	Spider lake	80,000
S. D. Hodsdon, Mellen	Bad river	80,000
Jos. Meinen, Mellen	Mineral lake	80,000
H. A. Veeder, Mellen	Hebert lake	80,000
J. Steffeck, Mellen	English lake	80,000
Lautz Parns, Mellen	Meader lake	80,000
John Weiss, Mellen	Meader lake	80,000
John Tobin, Mellen	Tyler Forks river	80,000
		1,840,000
BARRRON COUNTY—		
M. P. Barry, Rice Lake	Rice lake	80,000
F. R. Conn, Rice Lake	Rice lake	80,000
B. N. Webster, Rice Lake	Rice lake	80,000
Geo. McLeod, Rice Lake	Rice lake	80,000
O. G. Bannister, Rice Lake	Rice lake	80,000
J. H. Wilz, Rice Lake	Rice lake	80,000
Joe Scharbillig, Rice Lake	Rice lake	80,000
C. A. Stark, Rice Lake	Rice lake	80,000
H. F. Boortz, Rice Lake	Rice lake	80,000
F. D. Jackson, Eau Claire	Chetek lake	80,000
E. Kundson, Rice Lake	Rice lake	80,000
Lewis Larson, Cumberland	Scott lake	80,000
H. P. Peterson, Cumberland	Granite and Horse-shoe lakes	80,000
Cumberland-Commercial Club, Cumberland	Beaver Dam, Sand and Kidney lakes	240,000
Nick B. Nelson, Cumberland	Vermillion lake	80,000
A. F. Wright, Cumberland	Pike and Butternut lakes	80,000
G. L. Luff, Cumberland	Silver lake	80,000
W. G. Miller, Cumberland	Tickert's lake	80,000
H. S. Comstock, Cumberland	Beaver Dam lake	80,000
A. H. Miller, Cumberland	Wildcat lake	80,000
W. N. Fuller, Cumberland	Spirit and Moccasin lakes	80,000
		1,920,000
BAYFIELD COUNTY—		
Harry Moore, Cable	Cable lake	80,000
CHIPPEWA COUNTY—		
Joe Dietrich, Cadott	Pike lake	100,000
Ben Dietrich, Cadott	Pike lake	100,000
L. L. Thayer, Bloomer	Cornell lake	80,000
W. E. Kitch, Bloomer	Cornell lake	80,000
		360,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
CLARK COUNTY—		
John Moore, Thorp	Eau Claire river	100,000
COLUMBIA COUNTY—		
Frank Moran, Portage	Dates Mill pond	100,000
Herman Rueckert, Portage	Silvery lake	100,000
P. W. MacKenzie, Poynette	Rocky run	100,000
		300,000
DANE COUNTY—		
C. M. Clark, Stoughton	Lake Kegonsa	100,000
L. M. Trulson, Stoughton	Lake Kegonsa	100,000
T. C. Lund, Stoughton	Lake Kegonsa	100,000
J. M. Bailey, Stoughton	Lake Kegonsa	100,000
S. Y. Ames, Stoughton	Lake Kegonsa	100,000
J. H. Campbell, Stoughton	Lake Kegonsa	100,000
J. H. Weber, Monroe	Lake Kegonsa	200,000
M. D. Larson, McFarland	Lake Waubesa	100,000
J. E. Reed, McFarland	Lake Waubesa	100,000
C. P. Moore, McFarland	Lake Waubesa	100,000
E. H. Edward, McFarland	Lake Waubesa	100,000
J. S. Johnson, McFarland	Lake Waubesa	200,000
Wm. Wolf, Madison	Lake Mendota	650,000
Frank Ramsdale, Madison	Lake Monona	550 000
Henry Ross, Belleville	Sugar river	50,000
Thomas and Harmon, Belleville	Sugar river	50,000
Jonas Berg, Belleville	Sugar river	50,000
E. S. Bennett, Belleville	Sugar river	50,000
Arthur Sykes, Madison	Wingra lake	400,000
		3,200,000
DODGE COUNTY—		
Henry Boehmer, Mayville	Rock river	100,000
Anton Welch, Mayville	Rock river	100,000
R. J. Logenbach, Mayville	Rock river	50,000
Otto W. A. Radloff, Hustisford	Hustisford pond	100,000
Geo. M. Bagley, Neosho	Neosho pond	100,000
C. W. Harvey, Beaver Dam	Beaver Dam lake	200,000
W. C. North, Fox Lake	Fox lake	400,000
		1,050,000
DUNN COUNTY—		
F. A. Vasey, Menomonie	Little Menomonie river	50,000
Oscar Melbye, Menomonie	Little Menomonie river	50,000
H. W. Johnson, Menomonie	Little Menomonie river	50,000
Adolph Sevenson, Menomonie	Little Menomonie river	50,000
C. O. Sandvig, Menomonie	Little Menomonie river	50,000
C. Baker, Wheeler	North Fork Hay river	100,000
Wm. Schutte, Jr., Menomonie	Little Menomonie river	50,000
		400,000
EAU CLAIRE COUNTY—		
Chas. Stiding, Altoona	Five-mile lake	100,000
W. T. Dugame, Altoona	Lake Altoona	50,000
Wm. H. Hawker, Altoona	Lake Altoona	50,000
L. A. McKinley, Altoona	Lake Altoona	50,000
John Brog, Eau Claire	Eau Claire river	50,000
John A. Hansen, Eau Claire	Eau Claire river	50,000
J. Baumberger, Eau Claire	Eau Claire river	50,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
EAU CLAIRE COUNTY—Continued.		
J. Kopplin, Eau Claire	Eau Claire river	50,000
A. E. Walrich, Eau Claire	Dells pond	100,000
Leopold Kortsch, Eau Claire	Chippewa river	100,000
Marshall Cousins, Eau Claire	Long lake	100,000
E. W. Heiss, Eau Claire	Round lake	80,000
		830,000
FOND DU LAC COUNTY—		
Tinkham Bros., Fairwater	Grand river	150,000
E. P. Worthing, Fond du Lac	Lake De Nevu	100,000
E. H. Ordway, Fond du Lac	Lake De Nevu	50,000
P. A. Hoffman, Campbellsport	Lake fifteen	100,000
Wm. Weddle, Campbellsport	Lake fifteen	100,000
		500,000
FOREST COUNTY—		
Fred Morey, Wabeno	Trump lake	80,000
Andrew Mueller, Wabeno	Hinley lake	80,000
D. W. Connor, Laona	Silver lake	80,000
W. D. Connor, Laona	Birch lake	80,000
Connor Lbr. and Land Co., Laona	Silver lake	80,000
Joseph J. Martin, Laona	Birch lake	80,000
		480,000
GREEN COUNTY—		
E. W. Van Norman, Monticello	Sugar river and Tribs.	100,000
D. H. Morgan, Albany	Sugar river	100,000
		200,000
GREEN LAKE COUNTY—		
Ed. Borst, Princeton	Fox river	150,000
IOWA COUNTY—		
Thomas Graber, Mineral Point	Pecatonica river	150,000
A. Appel, Mineral Point	Pecatonica river	150,000
		300,000
IRON COUNTY—		
J. C. Withington, Mercer	Turtle water	80,000
Bell Bros., Mercer	Echo lake	80,000
Geo. C. Foster, Hurley	Pine lake	120,000
M. J. Connors, Hurley	Island lake	160,000
J. H. Lawler, Hurley	Moose lake	160,000
Fred Davis, Mercer	Tank lake	160,000
		760,000
JACKSON COUNTY—		
E. E. Moore, Merrillan	Merrillan Mill pond	100,000
J. C. Taggart, Merrillan	Grist Mill pond	50,000
J. H. Williams, Merrillan	Merrillan Mill pond	100,000
		250,000
JEFFERSON COUNTY—		
E. P. Mansfield, Lake Mills	Rock lake	400,000
Edw. Schultz, Waterloo	Maunesha river	100,000
Dr. W. H. Weld, Fort Atkinson	Rock river	100,000
Jos. Stoppenbach, Jefferson	Rock river	150,000
		750,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
JUNEAU COUNTY—		
Henry Hagemann, Mauston	Lemonweir river	100,000
Elmer Weatherby, Mauston	Lemonweir river	50,000
C. P. Bradley, Mauston	Lemonweir river	50,000
C. F. Altenberg, Mauston	Lemonweir river	50,000
P. J. Comer, Mauston	Lemonweir river	50,000
John Turner, Mauston	Lemonweir river	100,000
Chas. C. Chase, Elroy	Mill pond	100,000
Geo. M. Frohmader, Camp Douglas	Little Lemonweir river	100,000
S. E. Gleason, Camp Douglas	Big Lemonweir river	50,000
Cecil J. Phillps, Camp Douglas	Big Lemonweir river	100,000
G. M. Reed, Necedah	Yellow river	120,000
T. M. Canfield, Necedah	Yellow river	120,000
J. E. Daly, Necedah	Yellow river	120,000
W. S. Hess, Necedah	Yellow river	120,000
		1,230,000
KENOSHA COUNTY—		
Alvin Paddock, Salem	Paddock lake	150,000
E. M. Stannard, Bristol	Lake George	150,000
Frank Zerfas, Twin Lake	Lakes Mary and Elizabeth	100,000
F. H. Schenning, Silver Lake	Silver lake	200,000
Wm. Luke, Wheatland	Lily lake	150,000
		750,000
KEWAUNEE COUNTY—		
Trudell and Kalhofer, Luxemburg	Scarbora river	100,000
Felix Moraux, Luxemburg	Trudell mill pond	150,000
Ernest Bruemmu, Algoma	South branch of Ahnapee river	150,000
		400,000
LA FAYETTE COUNTY—		
Walter Warren, South Wayne	Pecatonica river	150,000
M. P. Kennedy, Gratiot	Pecatonica river	100,000
		250,000
LANGLADE COUNTY—		
Herman A. Muller, Polar	Muller lake	80,000
Chas. Schotte, Antigo	Eau Claire river	80,000
Theo. Lenzer, Kempster	Long lake	80,000
George Breneir, Summit Lake	Bass lake	80,000
Emil S. Weisse, Post Lake	Post lake	160,000
J. H. Hopkins, Antigo	Summit lake	80,000
		560,000
LINCOLN COUNTY—		
John Pospisiel, Heineman	Scoville lake	80,000
L. A. Miller, Dudley	Scoville lake	80,000
O. M. Smith, Tomahawk	Clear and Clara lakes	80,000
B. F. Clark, Tomahawk	Muskellunge and Dear lakes.	80,000
H. Hoover, Heineman	Scoville lake	80,000
Joseph Yandar Jr., Heineman	Scoville lake	80,000
A. L. Wyart, Bloomville	Luek's lake	80,000
W. C. Weisel, Heineman	Anderson lake	80,000
C. L. Stephens, Heineman	Scoville lake	80,000
H. E. Kluetz, Merrill	Wisconsin river	80,000
Julius Theilman, Merrill	Bass lake	80,000
A. J. Stange, Merrill	Lake View	160,000
		1,040,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
MANITOWOC COUNTY—		
Anton Reif, Whitelaw	Branch river	100,000
John Reznichek, Whitelaw	Branch river	100,000
F. Jachinstal, Manitowoc	West Twin river	100,000
H. C. Gruebner, Sheboygan	Pigeon lake	100,000
S. W. Randolph, Manitowoc	English lake and Manitowoc river	400,000
		800,000
MARATHON COUNTY—		
Herm. R. Seim, Wausau	Eau Pliene river	160,000
John Schwister, Wausau	Trappe and Plover rivers	160,000
Alex Fehl, Wausau	Little Rib river	200,000
A. J. Dern, Wausau	Wisconsin river	160,000
John A. Moigedux, Wausau	Eau Claire river	200,000
T. R. Guenther, Knowlton	Wisconsin river	80,000
		960,000
MILWAUKEE COUNTY—		
Joe. Fennig, Milwaukee	Muskego lake	200,000
MONROE COUNTY—		
Her. Bartz, Wilton	Kickapoo river	100,000
John Scott, Warrens	Lemonweir river	100,000
Chas. L. Fox, Leon	Little La Crosse river	100,000
		300,000
OCONTO COUNTY—		
Lewis P. Perry, Gillette	Berry lake	80,000
ONEIDA COUNTY—		
E. H. Harding, Racine	Lake Julia	160,000
C. J. Coon, Woodruff	Trout lake	560,000
Robert Ripple, Woodruff	Tomahawk lake	2,000,000
H. Hansen, Minocqua	Squirrel lake	720,000
Mr. Poquette, Woodruff	Bass lake	240,000
D. H. Kahn, Woodruff	Johnson lake	160,000
		3,840,000
PEPIN COUNTY—		
Wm. P. Unser, Eau Galle	Eau Galle river	100,000
A. A. Huleatt, Arkansaw	Big and Little Arkansas rivers	100,000
Thos. F. Lucas, Durand	Tompson and Stump lakes	150,000
H. Nicklas, Durand	Wilcox Bean and Spooner lakes	150,000
		500,000
PRICE COUNTY—		
J. W. Hicks, Prentice	Lake Worcester	80,000
F. W. Donovan, Phillips	Elk lake	80,000
H. R. Soulen, Phillips	Deer lake	80,000
F. K. Randall, Phillips	High lake	80,000
		320,000
ROCK COUNTY—		
J. L. Hodson, Lima Center	Turtle lake	100,000
A. F. Fellows, Evansville	Gibbs lake	100,000
		200,000

A TROUT POND, WILD ROSE HATCHERY.

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
ST. CROIX COUNTY—		
Andrew Hope, Hammond	Bushnell and Casey lakes	100,000
Mike Steckmeyer, Roberts	Twin lake	100,000
Jas. Smith, Burkhardts	Bass lake	80,000
Bennine Jernson, Hudson	Bass lake	80,000
Charles McKinzee, Burkhardts	Bass lake	80,000
Ralph Burk, Burkhardts	Willow river	80,000
		520,000
SAUK COUNTY—		
A. D. Dorsett, Baraboo	Devils lake	100,000
L. J. Horstman, Baraboo	Devils lake	100,000
A. G. Buckley, Baraboo	Devils lake	100,000
F. E. Settergren, Baraboo	Devils lake	100,000
E. G. Mariott, Baraboo	Devils lake	100,000
Bert Cramer, Baraboo	Devils lake	100,000
John Wiggins, North Freedom	Mill pond	100,000
John O'Neil, North Freedom	Seeley creek pond	100,000
		800,000
SAWYER COUNTY—		
W. E. Cornick, Hayward	Spider lake	200,000
SHAWANO COUNTY—		
Fred E. Matz, Regina	Heming lake	80,000
I. L. Rice, Wittenberg	Galloway lake	80,000
Henry Larson, Ringle	Eau Claire river	80,000
		240,000
SHEBOYGAN COUNTY—		
R. G. Arnold, Glenbeulah	Mullet river	100,000
TAYLOR COUNTY—		
C. H. Howard, Medford	Lake Esidore	80,000
Louis Bauer, Medford	Sackets lake	80,000
Jerry Murphy, Medford	Nigger lake	80,000
Joseph Loeb, Medford	Clear lake	80,000
J. M. Hackett, Medford	Lake Esidore	80,000
L. E. Simerson, Medford	Yellow river	80,000
Gus. Skinner, Westboro	Twin lakes	80,000
Frank M. Perry, Westboro	James lake	80,000
Jas. Ujohn, Rib Lake	North Harper lake	80,000
A. J. Allard, Rib Lake	North Everson's lake	80,000
George F. Brann, Rib Lake	Harper's lake	80,000
		880,000
TREMPEALEAU COUNTY—		
F. K. Kellman, Galesville	Marinuka lake	100,000
VERNON COUNTY—		
E. B. Harkin, Hillsboro	Pond lake	100,000
R. Hammer, Hillsboro	Hillsboro Mill Pond	100,000
Morterud Bros., Westby	Trib. West Branch Kickapoo river	100,000
Ed. Kellicut, Viola	Elk run river	100,000
		400,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
VILAS COUNTY—		
F. W. McIntyre, Eagle River	Gordon lake	80,000
Victor Stevens, Eagle River	Catfish lake	80,000
H. C. Tellefson, Eagle River	Hunters lake	80,000
Carter and Emmons, Eagle River	Kathan lake	80,000
Chas. Zimpelmann, Eagle River	Katharine lake	80,000
Fred G. McIntyre, Eagle River	Catfish lake	80,000
Max Scheribel, Eagle River	Eagle Chain of lakes	80,000
Geo. Foster, Eagle River	Boot lake	80,000
Stephen Johnson, Eagle River	Lawson lake	80,000
Ed. Lacon, Eagle River	Dollar lake	80,000
A. Paisman, Eagle River	Gordon lake	80,000
W. H. Knox, Eagle river	Otter lake	80,000
Geo. St. Louis, Eagle River	Boot lake	80,000
Wm. Price, Eagle River	Price lake	80,000
Jas. Oberholtzer, Eagle River	Sand lake	80,000
R. D. McLeod, Eagle River	Lake Charles	80,000
John Radcliff, Eagle River	Sand lake	80,000
Julius Strelow, Lakota	Big and Little Twin lakes	80,000
L. D. Sargent, Conover	Pike and Lillian lakes	80,000
George Shelley, Conover	Little Twin lake	80,000
A. J. Burgess, Conover	Bass lake	80,000
A. E. Thomas, State Line	Lac Vieux Desert	200,000
D. H. Sargent, Conover	Big Twin lake	160,000
H. J. Sargent, Conover	Pioneer lake	160,000
Geo. Shelly, Conover	Big Twin lake	80,000
A. A. Babcock, Eagle River	Kentuck lake	80,000
Robert McGregor, Arbor Vitae	St. German lake	320,000
O. W. Sayner, Sayner	Plumb lake	320,000
B. F. Wilson, Star Lake	Ballard lake	80,000
B. J. Vaughan, Star Lake	Ballard lake	80,000
H. C. Simonds, Star Lake	Star lake	80,000
H. E. Salsich, Star Lake	Whiteland lake	80,000
Edward Parker, Star Lake	Whiteland lake	80,000
M. E. Murphy, Star Lake	Star Lake	80,000
C. M. Miles, Star Lake	Star Lake	80,000
Chas. Law Jr., Star Lake	Star Lake	80,000
R. C. Aylward, Star Lake	Star Lake	80,000
C. H. Blohm, Conover	Stormy lake	80,000
Wright Lbr. Co., Merrill	Trout lake	800,000
Max Ewald, Merrill	Alrich lake	80,000
A. K. Everett, Eagle River	Cranberry lake	80,000
		4,760,000
WALWORTH COUNTY—		
Z. P. Beach, Whitewater	Trippes lake	100,000
A. M. Hanson, Whitewater	Whitewater lake	100,000
Albert Kieman, Whitewater	Turtle lake	100,000
Brownell Bulkley, Whitewater	Lauderdale lakes	250,000
M. Emma Bergwall, East Troy	Booth lake	150,000
J. A. Collin, Delavan	Delavan lake	400,000
F. G. Thearle, Chicago	Lake Geneva	250,000
Edward Shepard, Lake Beulah	Lake Beulah	250,000
		1,600,000
WASHBURN COUNTY—		
Bert Countryman, Trego	Whaler lake	80,000
C. H. Dexter, Spooner	Sylane and Cable lakes	80,000
Frank Kasper, Sarona	Kasper lake	80,000
Hans Martinson, Madge	Martin lake	80,000
Forest Lovell, Shell Lake	Yellow river	80,000
Dr. I. G. Crowell, Shell Lake	Shell lake	80,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
WASHBURN COUNTY—Continued.		
B. C. Hanson, Shell Lake	Shell lake	80,000
C. J. Stover, Shell Lake	Shell lake	80,000
W. B. Hanson, Cumberland	Shell lake	80,000
A. A. Lovell, Shell Lake	Chain of lakes	160,000
		880,000
WASHINGTON COUNTY—		
Tom Courtney, Hartford	Pike lake	100,000
A. J. Hemmy, Hartford	Pike lake	100,000
Pottawatomie Club North Milwaukee	Pike lake	150,000
Francis J. Stiglbauer, Milwaukee	Amybelle lake	150,000
John Rosenheimer, Schleiseingerville	Big Cedar lake	250,000
		750,000
WAUKESHA COUNTY—		
Eph. Beaumont, Hartland	Beaver lake	200,000
Chas. Mueller, Nashotah	Moose lake	250,000
E. J. Mansur, W. Milwaukee	Nagawicka lake	400,000
Geo. R. Nash, Milwaukee	Upper Lake Nashotah	400,000
A. Murawsky, Milwaukee	Okauchee lake	100,000
Fred Leypoldt, Okauchee	Okauchee lake	150,000
Fred Luscher, Okauchee	Okauchee lake	200,000
Jas. P. Donlan, Eagle	Eagle lake	200,000
W. J. Turner, Eagle	Beaver Dam lake	100,000
Harry Hooper, Troy Center	Pleasant lake	100,000
F. W. F. Welch, Waukesha	Fox river	100,000
B. P. Langly, Dousman	School Section lake	100,000
Mr. Shultz, Dousman	Hunters lake	100,000
		2,400,000
WAUPACA COUNTY—		
Chas. H. Anderson, Scandinavia	Silver lake	200,000
M. S. Stroud, Symco	Union pond	100,000
G. C. Fergot, Embarrass	Clover Leaf lake	80,000
Anton Gauerke, Embarrass	Embarrass river	80,000
M. L. Palmer, Embarrass	Grass lake	80,000
Bert Palmer, Embarrass	Pine lake	80,000
Emil Fergot, Embarrass	Clover Leaf lake	80,000
		700,000
WAUSHARA COUNTY—		
C. E. Michaels, Wautoma	Bugh's lake	100,000
Lon. Nichols, Wautoma	Hill's lake	100,000
Otto Rodoll, Wautoma	Crystal and Bass lakes	100,000
P. E. Ades, Wautoma	Beans lake	100,000
Geo. Peterson, Saxville	Round lake	100,000
A. J. Stevens, Wild Rose	Silver lake	100,000
E. R. Humphrey, Wild Rose	Gilbert lake	150,000
J. V. Berens, Wild Rose	Silver lake	100,000
C. H. Pratt, Plainfield	First lake	100,000
Geo. Gustin, Plainfield	Plainfield lake	100,000
Buchanan Johnson, Plainfield	Plainfield lake	100,000
Ed. O'Connor, Hancock	Fish lake	100,000
M. Lathrop, Hancock	Fish lake	50,000
L. W. Beach, Hancock	Fish lake	50,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
WAUSHARA COUNTY—Continued.		
J. E. Foster, Hancock	Fish lake	50,000
Wm. L. Jones, Hancock	Fish lake	50,000
A. Hebblewhite, Hancock	Fish lake	50,000
G. N. Spaulding, Hancock	Pine lake	100,000
W. A. Roblier, Coloma Station	Pleasant lake	150,000
		1,750,000
WOOD COUNTY—		
Wm. H. Burchell, Grand Rapids	Farrells lake	80,000
W. C. Martin, Grand Rapids	Centralia Mill pond	120,000
A. B. Bever, Grand Rapids	Wisconsin river	120,000
Jas. G. Hamilton, Grand Rapids	Wisconsin river	120,000
L. A. Pepin, Grand Rapids	Hurley Mill pond	120,000
Chas. Pomainville, Grand Rapids	Wisconsin river	80,000
Owen Love, Grand Rapids	Centralia pond	120,000
E. Everbech, Grand Rapids	Biron pond	120,000
F. A. Stamm, Grand Rapids	Consolidated pond	120,000
James E. Brazeau, Nekoosa	Wisconsin river	80,000
Geo. B. Brazeau, Nekoosa	Wisconsin river	80,000
A. H. Kleberg, Nekoosa	Wisconsin river	80,000
Capt. Youngchild, Nekoosa	Wisconsin river	80,000
		1,320,000
Total wall-eyed pike fry, planted,	1907	**44,900,000**

Distribution of Fish.

BLACK BASS FRY PLANTED, 1907.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
CALUMET COUNTY—		
J. A. Hansen, New Holstein	Wilkes lake	2,000
A. J. Pfeffer, Chilton	Manitowoc river	2,000
Wilmer E. Bishop, Hilbert	Manitowoc river	2,000
		6,000
COLUMBIA COUNTY—		
W. R. Ketchum, Portage	Long lake	5,000
W. R. Turner, Columbus	Columbus Dam and Crawfish river	2,000
D. L. Floore, Columbus	Fall river Mill pond	2,000
S. O. Brien, Columbus	Loss lake	1,000
Frank H. Smith, Pardeeville	Pardeeville Mill pond	2,000
R. O. Spear, Pardeeville	Pardeeville lake	2,000
John R. Davis, Cambria	Cambria Mill pond	2,000
		16,000
DANE COUNTY—		
B. F. Compton, Stoughton	Lake Kegonsa	2,000
J. H. Weber, Stoughton	Lake Kegonsa	2,000
		4,000
DODGE COUNTY—		
M. E. Burke, Beaver Dam	Beaver Dam lake	1,000
W. C. North, Fox Lake	Fox lake	1,000
John Stoddart, Fox Lake	Fox lake	1,000
Murphy Bros., Fox Lake	Fox lake	2,000
Chas. D. Henderson, Mayville	Rock river	1,000
Henry Bohmer, Mayville	Rock river	1,000
		7,000
DOUGLAS COUNTY—		
F. W. Runkel, Superior	Twin lake	1,000
E. J. Favell, Superior	St. Croix lake	1,000
C. H. Howell, Superior	Ham lake	2,000
E. C. Maxfield, Superior	Long lake	1,000
Henry P. Evans, Superior	Island lake	1,000
J. C. McLean, Superior	St. Croix lake	1,000
E. W. Carey, Superior	Muskrat lake	1,000
J. M. Sayles, Solon Springs	Twin lake	1,000
William Frick, Solon Springs	Twin lake	1,000
Elling H. Lee, Superior	Ox lake	1,000
W. K. Crumpton, Superior	Lake St. Croix	1,000
F. R. Crumpton, Solon Springs	Twin lake	1,000
Frances Gates, Solon Springs	Black Fox lake	2,000
P. E. Waterbury, Solon Springs	Twin lake	1,000
Nicholas Lucius, Solon Springs	St. Croix lake	1,000
C. W. Bishop, Superior	Lake St. Croix	1,000
A. C. Slate, Wascott	Red lake	2,000
Thos. C. McLean, Superior	Red lake	2,000
Dan J. Bogne, Gordon	Whitefish lake	2,000
Dennis Crotty, Gordon	Whitefish lake	1,000
H. F. Drake, Gordon	Lake Favor	1,000
B. N. Padlock, Superior	Lader lake	2,000
F. J. Seguin, Superior	Bass and Clear lakes	2,000
Hattie F. Lowe, Gordon	Lake Favor	1,000
Wm. Wilkinson, Gordon	Spider lake	2,000
A. Berthime, Superior	Miles lake	2,000
Geo. A. Bubar, Gordon	Miles lake	2,000

Distribution of Fish.

BLACK BASS FRY PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
FOREST COUNTY—		37,000
W. E. Fairfield, Green Bay	Lake Lura	2,000
P. Shay, Armstrong Creek	Lake Nine	2,000
Flammer Steiger Lbr. Co., Blackwelle	Wind lake	3,000
Connor Lbr. Land Co., Laona	Birch and Silver lake	5,000
GREEN LAKE COUNTY—		12,000
J. E. Henning, Princeton	Fox river	2,000
Harry Morris, Dartford	Green lake	2,000
Ed. Borst, Princeton	Fox river	2,000
H. P. Cody, Green Lake	Green lake	2,000
JEFFERSON COUNTY—		8,000
Palmyra Springs Sanitarium, Palmyra	Palmyra Springs lake	2,000
G. A. Buzzell, Palmyra	Spring lake	2,000
Chas. E. Williams, Palmyra	Spring lake	2,000
JUNEAU COUNTY—		6,000
John Price, Mauston	Lemonweir river	4,000
F. M. Reed, Necedah	Yellow river	8,000
LA FAYETTE COUNTY—		8,000
Chas. Blanchard, Blanchardville	Pecatonica river	1,000
W. E. Robinson, Blanchardville	Trib. Pecatonica river	2,000
George Gould, Blanchardville	Trib. Pecatonica river	1,000
LINCOLN COUNTY—		4,000
G. W. Purvis, Merrill	Lake View	3,000
H. G. Hinckley, Merrill	Bass Lake	3,000
David Martz, Merrill	Lake View	4,000
MANITOWOC COUNTY—		10,000
J. C. Miller, Kiel	Pigeon lake	2,000
S. W. Randolph, Manitowoc	English lake	4,000
MARATHON COUNTY—		6,000
E .D. Underwood, Wausau	Big Rib river and Tribs.	8,000
MARINETTE COUNTY—		
John Strifler, Marinette	Thunder lake	2,000
Geo. H. Hartwell, Crivitz	Noquebay lake	3,000
Henry Strobel, Amberg	Beecher lake	2,000
Chas. H. Rector, Athelstane	Granite lake	2,000
MARQUETTE COUNTY—		9,000
C. E. Peirce, Germania	Comstock lake	2,000
F. J. Kimball, Briggsville	Lake Mason	4,000
MILWAUKEE COUNTY—		6,000
Wm. H. Dryer, Milwaukee	Saukville lake	2,000

Distribution of Fish.

BLACK BASS FRY PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
OCONTO COUNTY—		
John J. Hof, Sobieski	Little Sumaico river and Tribs.	2,000
Herman Dick, Suring	Nachickwa lake	2,000
Lewis P. Berry, Gillette	Berry lake	2,000
		6,000
ONEIDA COUNTY—		
John McCoy, Three lakes	Little Bass and Spirit lake	6,000
Edw. Kretlow, Wausau	Two Horsehead lakes	5,000
Mr. Johnson, Minocqua	Mercer lake	4,000
Mrs. M. Barnum, Minocqua	Shishebogema lake	4,000
J. Bolger, Minocqua	Long lake	4,000
D. Kahn, Minocqua	Johnson lake	3,000
F Bettis, Minocqua	Muskonegon lake	2,000
Henry Hanson, Minocqua	Squirrel lake	6,000
Frank Bachus, Minocqua	Lake Content	5,000
		39,000
OUTAGAMIE COUNTY—		
H. J. Van Vuren, Seymour	Loon lake	2,000
OZAUKEE COUNTY—		
John Weber Jr., Cedarburg	Trib. Milwaukee river	2,000
William Weber, Grafton	Milwaukee river	2,000
		4,000
POLK COUNTY—		
B. S. Isaacson, Dresser Junction	Big Horse-Shoe lake	2,000
H. H. Hart, Amery	Sucker lake	1,000
Ed. H. Holliday, Amery	North Twin lake	1,000
S. L. Pennington, Amery	Pike lake	1,000
J. A. Young, Amery	Pike lake	2,000
W. H. Holliday, Amery	Apple river	2,000
Dan Kinney, Amery	South Twin lake	2,000
Frank A. Brant, Nye	Round lake	2,000
L. P. Melfostad, Deronda	Mud lake	1,000
Geo. A. Sylvester, Deronda	Mud lake	2,000
John Wickerling, Deronda	Mud lake	2,000
Theo. Mickelson, Deronda	Sucker lake	2,000
F. H. Rasmussen, Dresser Junction	Big Horse-Shoe lake	2,000
		22,000
PORTAGE COUNTY—		
L. P. Moen, Stevens Point	To-morrow river	2,000
E. Viertel, Stevens Point	Wisconsin river	2,000
T. L. McGlachlin, Stevens Point	Wisconsin river	2,000
F. M. Milbery, Stevens Point	Plover river	1,000
A. G. Green, Stevens Point	Wisconsin river	1,000
		8,000
RUSK COUNTY—		
W. L. Stephenson, Ladysmith	Big Thorn Apple lake	2,000
R. J. Caley, Bruce	Caley lake	2,000
D E Getchel, Weyerhauser	Bass lake	2,000
		6,000
SAWYER COUNTY—		
C. D. Benack, Hayward	Round lake	8,000

Distribution of Fish.

BLACK BASS FRY PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
SHAWANO COUNTY—		
A. Kuckuk, Shawano	Loon lake	2,000
H. C. Scheller, Cecil	Shawano lake	2,000
H. C. Kretzman, Shawano	Lake Gennesaret	2,000
A. C. Weber, Shawano	Wold river	2,000
M. J. Wallrich, Shawano	White Clay lake	2,000
E. F. Decker, Embarrass	Pine lake	2,000
W. H. Burgoyne, Cecil	Long lake	2,000
		14,000
SHEBOYGAN COUNTY—		
Mathias Heinen, Random Lake	Random lake	2,000
Emil Haehnke, Random Lake	Spring lake	1,000
H. C. Gruebner, Sheboygan	Onion river	2,000
E. Underhill, Winooski	Lake Ellen	2,000
Joe. W. Steele, Plymouth	Little Elkhart lake	2,000
Sigmund Bloomfield, Elkhart Lake	Elkhart lake	2,000
W. F. Pinnow, Elkhart	Elkhart lake	2,000
Aug. Goetsch, Franklin	Goetsch lake	2,000
Chas. G. Peck, Sheboygan Falls	Sheboygan river	2,000
J. T. Hoff, Milwaukee	Random lake	2,000
		19,000
VILAS COUNTY—		
F. W. McIntyre, Eagle River	Gordon lake	2,000
Henry Cummings, Eagle River	Boot lake	2,000
Michael Welsh, Eagle River	Clear lake	2,000
R. D. McLeod, Eagle River	Clear lake	2,000
A. A. Babcock, Appleton	Kentuck lake	2,000
W. J. Walsh, Eagle River	Big and Little Twin lakes	2,000
C. H. Blohm, Conover	Clear lake	2,000
And. Hansen, Conover	Pioneer lake	2,000
Mr. Wallow, Star Lake	Star lake	3,000
J. Coon, Woodruff	Trout lake	10,000
		29,000
WALWORTH COUNTY—		
Fred Holden, Whitewater	Whitewater lake	2,000
Geo. McDougall, Whitewater	Whitewater lake	2,000
A. C. Hanson, Whitewater	Bass lake	2,000
Z. P. Beach, Whitewater	Trippe's lake	2,000
		8,000
WASHBURN COUNTY—		
F. L. Lampson, Lampson	Silver lake	2,000
J. J. Hohl, Minong	Gilmore lake	2,000
A. J. Hansen, Minong	Lake Williams	1,000
W. H. Granger, Minong	Granger lake	1,000
Henry Johnson, Minong	Twin lake	1,000
Ralph R. Jones, Minong	Red lake	1,000
John N. Gilbert, Minong	Pond lake	1,000
Albert E. Sampson, Minong	Horse-shoe lake	1,000
		10,000
WAUKESHA COUNTY—		
Mr. Phelps	Pewaukee lake	15,000
Albert Gallagher, Delafield	Lake Nagawicka	12,000
Wm. Kunz, Delafield	Pewaukee lake	8,000
E. Lacy, Okauchee	Okauchee lake	15,000
		50,000

Distribution of Fish.

BLACK BASS FRY PLANTED, 1907—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
WAUPACA COUNTY—		
Irving P. Lord, Waupaca	Chain of lakes	10,000
H. A. Meilke, Clintonville	Pine lake	2,000
		12,000
WAUSHARA COUNTY—		
G. H. Fuller, Spring Lake	Spring lake	1,000
A. J. Stevens, Wild Rose	Hills lake	2,000
J. V. Berens, Wild Rose	Hills lake	2,000
E. R. Humphrey, Wild Rose	Gilbert lake	2,000
		7,000
WOOD COUNTY—		
Wm. Paape, Vesper	Maple river	2,000
James E. Brazeau, Nekoosa	Hammond lake	1,000
Geo. B. Brazeau, Nekoosa	Hammond lake	1,000
A. H. Kleberg, Nekoosa	Ross lake	1,000
Capt. Youngchild, Nekoosa	Ross lake	2,000
		7,000
Total black bass fry planted	1907	399,000

Distribution of Fish.

LAKE TROUT FRY PLANTED, 1907.

Where Planted.	No. of Fish.
In Chequamegon Bay, Lake Superior	2,284,000
In Court O'Reilles lake, Sawyer county	400,000
In Round lake, Oneida county	400,000
In Rusk lake, Oneida county	400,000
In Big Portage lake, Vilas county	75,000
In Big Sand lake, Vilas county	120,000
Butternut and Franklin lakes, Oneida county	105,000
In Tomahawk lake, Oneida county	700,000
In Pelican lake, Oneida county	400,000
In Owens lake, Oneida county	400,000
In Beaver Dam, Vermillion, and Big Sand lakes, Barron county	100,000
In Tozer lake, Washburn county	100,000
In Gull lake, Washburn county	40,000
In St. Croix lake, Douglas county	80,000
In Pike lake, Bayfield county	100,000
In Sand-bar lake, Douglas county	75,000
In Lake Superior, off Presque Island	1,550,000
In Lake Superior, off Rasberry Island	775,000
In Lake Superior, off Sand Island	1,550,000
In Lake Superior, off York Island	775,000
In Lake Superior, off Wilson Island	775,000
In Lake Michigan, out from Racine	2,100,000
In Lake Michigan, out from Sheboygan	2,250,000
In Lake Michigan, out from Manitowoc	1,300,000
In Lake Michigan, out from Algoma	250,000
In Lake Michigan, out from Sturgeon Bay	1,000,000
In Lake Michigan, out from Port Washington	1,000,000
In Green Bay	1,620,000
Total lake trout fry planted, 1907	19,724,000

WHITEFISH FRY PLANTED, 1907.

Where Planted.	No. of Fish.
In Lake Michigan, out from Port Washington	5,000,000
In Lake Michigan, out from Racine	4,750,000
In Lake Michigan, out from Marinette	2,500,000
In Lake Michigan, out from Sheboygan	4,375,000
In Lake Michigan, out from Manitowoc	1,750,000
In Green Bay, out from Sturgeon Bay	3,650,000
In Green Bay, out from Green Bay harbor	5,000,000
Total whitefish fry planted, 1907	27,025,000

Distribution of Fish.

MUSKELLUNGE FRY PLANTED, 1907.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
E. Stevens, Eagle River	Catfish lake	14,000
E. A. Everett, Eagle River	Cranberry lake	28,000
W. H. Brown, Three Lakes	Three lakes	28,000
Mr. Graves, Three Lakes	Three lakes	14,000
A. K. Everett, Eagle River	Cranberry lake	28,000
John Radcliff, Eagle River	Sand lake	14,000
R. D. McLeod, Eagle River	Lake Charles	14,000
D. H. Sargent, Conover	Big Twin lake	14,000
Alex L. Towne, Lac du Flambeau	Pine lake	70,000
Geo. Foster, Hurley	Pine lake	28,000
F. E. Mathes, Merrill	Lake View	14,000
J. Coon, Woodruff	Trout lake	14,000
H. Hansen, Minocqua	Squirrel lake	14,000
James Wright, Merrill	Trout lake	14,000
Robert Ripple, Woodruff	Carroll lake	42,000
Robert Ripple, Woodruff	Minocqua lake	35,000
David Jossart, Minocqua	Tomahawk lake	35,000
Total muskellunge fry planted, 1907		420,000

MISCELLANEOUS DISTRIBUTION, 1907.

	No.
Trout and other kinds furnished fairs, fountains and aquariums	1,050
Mature rainbow trout planted in Nine-spring creek, Dane county	1,765
Furnished Nebraska Fish Commission, eyed lake trout eggs in exchange	100,000
Black bass fingerlings planted in Birch lake, Forest county	6,500
Black bass fingerlings planted in Pecatonica river at Mineral Point, Iowa county	2,550
Black bass fingerlings planted in Mississippi river	1,450
White bass fingerlings planted in Minocqua lake, Oneida county	1,250
Pickerel fry planted in Minocqua lake, Oneida county	280,000
Impregnated pickerel eggs, planted in Lake Mendota, Dane county	2,950,000
Land locked salmon planted in Trout lake, Vilas county	20,000
Rainbow trout, one-year old, planted in Oconto river, Forest county	5,000
Rainbow trout, one-year old, planted in Pine river, Waushara county	3,225
Rainbow trout, one-year old, planted in Peshtigo river, Forest county.	2,236
Rainbow trout, one-year old, planted in Red Cedar river and Rice lake, Barron county	3,750
Rainbow trout, one-year old, planted in Chippewa river at Glidden, Ashland county	3,750
Rainbow trout, one-year old, planted in Nemacogin river, Sawyer county	3,750
Rainbow trout, two-years old, planted in Kellog's pond and Spring brook, Langlade county	1,500
Total	3,027,776

Distribution of Fish.

SUMMARY OF OUTPUT OF HATCHERIES AND STATIONS, 1907.

MADISON HATCHERY.		
Brook trout, advanced fry	*764,000	
Rainbow trout, advanced fry	*1,188,500	
Mature rainbow trout	1,765	
Furnished fairs, fountains and aquariums	144	
Total output, Madison hatchery		1,954,409
BAYFIELD HATCHERY.		
Brook trout, advanced fry	*1,466,000	
Rainbow trout, advanced fry	*475,000	
Lake trout fry	11,204,000	
Two-year rainbow trout	2,725	
Yearling rainbow trout	20,486	
Lake trout eggs furnished Nebraska Fish Commission in exchange	100,000	
Furnished fairs, fountains, aquariums, etc.	706	
Total output, Bayfield hatchery		13,268,917
OSHKOSH HATCHERY.		
Lake trout fry	8,520,000	
Whitefish fry	27,025,000	
Wall-eyed pike fry	22,900,000	
Total output, Oshkosh hatchery		58,445,000
MINOCQUA HATCHERY.		
Wall-eyed pike fry	22,000,000	
Black bass fry	233,000	
Muskellunge fry	420,000	
Pickerel fry	280,000	
Land locked salmon fry	20,000	
Total output, Minocqua hatchery	22,953,000	
DELAFIELD HATCHERY.		
Black bass fry		166,000
MISCELLANEOUS.		
Black bass fingerlings from Mississippi river		10,500
Pickerel eggs from Catfish river		2,590,000
White bass fingerlings from Fox river at Neenah		1,250
Sundry kinds		200
Total output, from all sources		99,389,276

* Includes fry retained at the hatchery.

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
ADAMS COUNTY—		
F. M. Reed, Necedah	Little Roche a Cri creek	2,000
Wm. Hopper, Friendship	Little Roche a Cri creek	2,000
Chas. H. Gilman, Friendship	Bingham creek	2,000
		6,000
ASHLAND COUNTY—		
M. C. Tomkins, Ashland	Cedar creek	2,000
H. C. Grimes, Ashland	Fish creek	2,000
A. W. Rowe, Ashland	Little Whitney creek	2,000
A. L. Rowe, Ashland	East creek	2,000
W. Calkins, Ashland	Long lake Branch	2,000
A. B. Spidle, Ashland	Spring Brook creek	2,000
Bear Lake Club, Ashland	West Trout brook	2,000
W. G. Nohl, Ashland	Rapid creek	2,000
H. L. Smart, Butternut	Bear creek	2,000
R. B. Whiteside, Butternut	Stoney creek	2,000
Ralph Smart, Butternut	Deer creek	2,000
Jos. H. Smart, Butternut	Agenda creek	2,000
Clarence Smart, Butternut	Steels creek	2,000
D. F. Tyler, Glidden	East Fork Chippewa Crossing	2,000
Hugo Schmidt, Glidden	Head of Moose river	2,000
Frank Torrey, Glidden	Dryden creek	2,000
John Wood, Glidden	Creek in Sec. 27, R. 10, T. 43	4,000
Sam Kubley, Glidden	Head of Moose river	2,000
		38,000
BARRON COUNTY—		
A. J. Osborne, Barron	Doerty creek	2,000
B. F. Kinsley, Barron	Upper Pine creek	2,000
J. Borum, Barron	Miller creek	2,000
Geo. R. Borum, Barron	Quarder creek	2,000
Geo. Post, Barron	Miller creek	2,000
D. D. Page, Barron	Miller creek	2,000
H. C. Berg, Barron	Hickey creek	2,000
DeWitt Post, Barron	Four-mile creek	2,000
T. W. Borum, Barron	Johnsons creek	4,000
H. W. Carr, Hillsdale	Upper Pine creek	4,000
Guy Dick, Hillsdale	Upper Pine creek	2,000
Ralph Kipp, Dallas	Pine creek	2,000
D. A. Russell, Dallas	Gouren creek	2,000
Geo. Kellnar, Dallas	South Pine creek	2,000
Sofus Moe, Dallas	Doe creek	2,000
E. Engh, Dallas	Browns and Otter creeks	2,000
Frank Dorey, Dallas	Tribs. to South Pine creek	2,000
C. E. Griffin, Cumberland	Spring brook	2,000
W. N. Fuller, Cumberland	McKenzie brook	2,000
A. H. Miller, Cumberland	Miller creek	2,000
H. S. Comstock, Cumberland	Sand creek and Hay river	4,000
W. G. Miller, Cumberland	Sand creek	2,000
G. L. Luff, Cumberland	Hickey creek	2,000
L. E. Griswold, Turtle Lake	Smiths creek	2,000
A. O. Blix, Turtle Lake	Beaver creek	2,000
J. H. Bunker, Turtle Lake	Turtle creek	4,000
A. Rosenbush, Turtle Lake	Beaver brook	4,000
Henry Field, Rice Lake	Tuscobia creek	2,000
Jasper E. Olson, Rice Lake	Moons creek	2,000
Arthur J. Overby, Rice Lake	De Mars creek	2,000
S. S. Morrison, Rice Lake	Cranberry creek	2,000
Oscar Overby, Rice Lake	Rice creek	2,000
Thos. P. Morrison, Rice Lake	Pine creek	2,000
H. P. Schneider, Rice Lake	Pekagema creek	4,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
BARRON COUNTY—Continued.		
Roy Gilbert, Chetek	Moose-ear creek	4,000
George Calkins, Chetek	McDurmet creek	2,000
Nels A. Anderson	North creek	4,000
S. A. Mauseth, Cameron	Cranberry creek	4,000
H. E. Miller, Cameron	Pekagema creek	2,000
		96,000
BAYFIELD COUNTY—		
F. Schlecht, Ashland	Pine creek	2,000
E. J. Shephard, Ashland	Little Pine creek	2,000
R. B. Prince, Ashland	Pine creek	2,000
W. E. Weschel, Moquah	Pine creek	2,000
Gust Headquist, Iron River	Iron river	2,000
J. Schackte, Iron River	East Branch Iron river	2,000
H. H. Jewett, Iron River	Muskeg river	2,000
H. L. Lea, Iron River	Middle river	2,000
C. H. Miles, Iron River	Iron river	2,000
E. A. Ross, Iron River	Ox-bow creek	2,000
H. C. Hall, Iron River	Iron river	2,000
W. B. Rea, Ashland	Fish creek	2,000
John Gavin, Ashland	Fish creek	2,000
J. V. Woodhead, Ashland	Cedar creek	2,000
M. C. Tomkins, Ashland	Pine creek	2,000
Rust Owen Lbr. Co., Drummond	Tributary to White river	4,000
Frank Nemec, Cable	Namakagon river	2,000
Joe. La Pointe, Cable	Head waters of Namakagon river	2,000
Harry Moore, Cable	Namakagon river	2,000
Wm. Bixby, Cable	Namakagon river	2,000
O. B. Crandall, Cable	Big brook	2,000
W. V. Caldwell, Grand View	Twenty-mile creek	2,000
S. Jacobson, Grand View	Eighteen-mile creek	2,000
Geo. Bishop, Grand View	Long lake branch	2,000
John Sayles, Grand View	Pearl creek	2,000
G. N. Rosjord, Ashland	Burg Park brook	4,000
D. F. Dickinson, Nutt	Four-mile creek	4,000
C. O. Sowder, Washburn	Sioux river	4,000
J. L. Smith, Washburn	Little Sioux river	4,000
D. W. Maxcy, Washburn	Diamond creek	2,000
		70,000
BROWN COUNTY—		
Jas. A. Powlas, Oneida	Trout creek	4,000
Elmer S. Hall, Green Bay	Beaver Dam creek	4,000
John A. Kittel, Green Bay	Kittell creek	4,000
Wm. Hamilton, Pulaski	North Branch Suamico river.	4,000
E. B. Morgan, Suamico	Hallard creek	4,000
W. E. Burdeau, Flintville	Suamico river and Beaver Dam creek	4,000
		24,000
BUFFALO COUNTY—		
A. D. Alt, Mondovi	Elk creek	2,000
H. E. Erickson, Mondovi	Dutch creek	2,000
A. H. Erickson, Mondovi	Whelan creek	2,000
P. B. Amison, Mondovi	Brown creek	2,000
C. H. Cook, Mondovi	Cook's creek	2,000
C. E. Otis, Mondovi	Cranberry creek	2,000
A. J. Branstad, Mondovi	Coon creek	2,000
		14,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
CHIPPEWA COUNTY—		
K. C. Morehouse, Stanley	Junge and Wolf rivers	4,000
Nels Stalheim, Stanley	Otter creek	2,000
John E. Schafer, Stanley	Hay creek	2,000
L. P. Stevens, Stanley	Swim creek	2,000
Chas. Marriner, Cadott	Beaver creek	2,000
V. Kesl, Jr., Cadott	Bentley creek	2,000
Ben Dietrick, Cadott	Pane creek	2,000
Matt Dietrick, Cadott	Tiffney creek	2,000
S. R. Kaiser, Cadott	Blanchette creek	2,000
C. S. Little, Stanley	Jackson and Meyers creeks	4,000
G. T. Somle, Cornell	Cornell brook	4,000
Ray Cleaves, Holcombe	Hay creek	4,000
P. H. Kennedy, Hannibal	Hay creek	4,000
D. L. Mohr, Hannibal	Bear creek	4,000
Bernard Loelmis, Bloomer	Cony creek	2,000
A. Dietlein, Bloomer	Duncan creek	2,000
Albert Anderson, Bloomer	Crisman creek	2,000
H. M. Trankle, Bloomer	McCann creek	2,000
Andrew Hickethin, Bloomer	Trout creek	2,000
L. L. Thayer, Bloomer	Little Beaver creek	2,000
R. H. Cosgriff, Chippewa Falls	McCann creek	2,000
Rod Carroll, Chippewa Falls	Stilson creek, East Fork	2,000
S. B. Nimmons, Chippewa Falls	Hay creek	2,000
Chris. Nelson, Chippewa Falls		2,000
Geo. S. Raymond, Chippewa Falls	Trout creek	2,000
Edward Riester, Chippewa Falls	Duncan creek	2,000
J. H. Gentry, Chippewa Falls	Hatch creek	2,000
E. A. Firth, Chippewa Falls	Coffan creek	2,000
Alex Johnstone, Chippewa Falls	Little Hay creek	2,000
		70,000
CLARK COUNTY—		
Gilbert Johnson, Neillsville	Mound creek	2,000
Otto Lawrence, Neillsville	Spring Brook creek	2,000
F. D. Condit, Neillsville	Jack creek	2,000
Lester Tilton, Neillsville	Lindsey creek	2,000
C. R. Sturdevant, Neillsville	Wages creek	2,000
Chester Crundell, Humbird	Halls creek	4,000
Albert Buss, Curtiss	Branch of North Fork	4,000
M. D. Garrison, Thorp	Sterling creek	4,000
Geo. B. Parkhill, Thorp	Sterling creek	2,000
A. Lamont, Colby	Trout creek	4,000
H. J. Blanchard, Colby	Harveys spring	4,000
H. B. Eder, Colby	Thelig creek	2,000
		34,000
COLUMBIA COUNTY—		
E. Hinkson, Poynette	Hinkson creek	4,000
Tony Kiennert, Portage	Little Neenah creek	4,000
		8,000
CRAWFORD COUNTY—		
Geo. H. Davidson, Soldiers Grove	Soldiers Grove and Trout creeks	30,000
DANE COUNTY—		
C. M. Evans, Mt. Horeb	Black Earth creek	2,000
John Vilberg, Mt. Horeb	Mount Vernon creek	2,000
J. T. Moe, Mt. Horeb	Middle Branch Sugar river	2,000
O. P. Berg, Mt. Horeb	Erb stream	2,000
E. S. Bennett, Belleville	Gill creek	4,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
DANE COUNTY—Continued.		
Joness Berg, Belleville	Lyle creek	2,000
Henry Ross, Belleville	Milims and East Marsh creeks	4,000
Sam'l Martin, Mt. Horeb	Spring creek	4,000
F. W. Curtis, Madison	Token creek	4,000
J. W. Groves, Madison	Token creek	4,000
		30,000
DODGE COUNTY—		
Eugene Ziegler, Mayville	Tributary Rock river	8,000
W. H. Thorpe, Beaver Dam	Spring brook	4,000
		12,000
DOUGLAS COUNTY—		
M. C. Nye, Superior, Sta. A.	Railton creek	4,000
P. E. Waterbury, Solon Spring	Ox creek	2,000
Nicholas Lucius, Solon Spring	Brule river	2,000
Max Weichelt, Solon Spring	Crotty river	2,000
L. M. Coleman, Solon Spring	Bukaty brook	2,000
Francis Pattee, Solon Spring	Shillings creek	2,000
S. B. Sullivan, Solon Spring	Ox creek	2,000
W. H. Bonnell, Hawthorne	Streams Trib. to main Amnicon river	4,000
John Gothner, Superior	Middle river	2,000
Chas. A. Kurrasch, Superior	Middle river	2,000
W. H. Crampton, Superior	Tributaries of Middle river	2,000
Frank A. Ross, Superior	Barnes creek	4,000
E. J. Stonge, Superior, Sta. A.	Branch of American river	4,000
C. S. Cooley, Superior, Sta. A.	Railton creek	4,000
Chas. E. Solberg, Brule	Hedin creek	2,000
Oscar W. Labquist, Brule	Mackey creek	2,000
W. T. Mount, Brule	Beaver river	2,000
J. A. Lansworth, Brule	Sandy river	2,000
Jos. Lucius, Brule	Brule river	8,000
Chas. J. Daniels, Poplar	Poplar river	4,000
F. J. Sequin, Superior	Rock creek	4,000
B. T. Ellison, Superior	Empire creek	4,000
Arch McKay, Superior	Little Balsam creek	4,000
Geo. Marley, Superior	State Line creek	4,000
I. L. Lenroot, Superior	Gooseberry creek	4,000
Jack Harris, Foxboro	State Line creek	4,000
		82,000
DUNN COUNTY—		
W. G. Wahl, Elk Mound	Spring brook	2,000
C. D. Cannan, Elk Mound	Peter creek	2,000
O. J. Garton, Elk Mound	Little Elk creek	2,000
E. S. Gregerson, Elk Mound	Elk creek	2,000
Dr. J. H. Proudlock, Wheeler	Little Beaver creek	2,000
Robt. M. Porter, Wheeler	Little Otter creek	2,000
Dick Goodell, Wheeler	Big Otter creek	2,000
F. J. Basner, Wheeler	Kings creek	2,000
Geo. E. Scott, Prairie Farm	Jones creek	4,000
Lyle Daigneau, Boyceville	Browns creek	2,000
John Olson, Boyceville	Big Meadow creek	2,000
Frank Eicher, Boyceville	Haff creek	2,000
O. E. Skamser, Boyceville	Brown's creek	2,000
Jos. D. Wilde, Downing	Beaver and Tiffany creeks	4,000
B. F. Breitingross, Wheeler	La Farge creek	2,000
Elbert Hill, Colfax	Camb's creek	2,000
A. L. Ivenfeldt, Menomonie	Simmonsoy creek	2,000
Elmer B. Hill, Menomonie	Trout creek	2,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
DUNN COUNTY—Continued.		
Alfred Peterson, Menomonie	Gilbert creek	2,000
Milton O. Doolittle, Menomonie	Hatchville branch	2,000
Gust Stewding, Menomonie	Dunkard creek	2,000
Wm. Schuette, Jr., Menomonie	Rusk creek	2,000
R. G. Ingraham, Menomonie	Thersa creek	2,000
N. J. MacArthur, Menomonie	Iron creek	2,000
C. R. Case, Knapp	Wilson and Gilbert creeks	4,000
Rudolph Jungwirth, Durand	Dusham creek	2,000
Geo. R. Topliss, Eau Galle	Maple spring	2,000
I. Seipel, Weston	Anderson creek	4,000
A. E. Roe, Weston	Anthony Ballard creek	2,000
J. H. Forester, Weston	Herman More creek	2,000
		68,000
EAU CLAIRE COUNTY—		
Chas. M. Sherwood, Fairchild	Morrill creek	2,000
C. C. Calkins, Fairchild	Marvin creek	2,000
Wm. F. Hood, Fairchild	McLaven creek	2,000
F. W. Herbst, Fairchild	Scott creek	2,000
I. Shoudy, Fairchild	Several Tribs., North Fork Eau Claire river	2,000
Wm. Swanke, Augusta	Bears-grass creek	4,000
S. A. Russell, Fall Creek	Otter creek	2,000
Henry Wise, Fall Creek	Beaver creek	2,000
O. W. Niebuhr, Fall Creek	Bear-grass creek	2,000
S. Russell, Fall Creek	Otter creek	2,000
P. Lindenthaler, Fall Creek	Fall creek	2,000
Chas. Stiding, Altoona	Seven-mile creek	2,000
W. T. Duganne, Altoona	Six-mile creek	2,000
Wm. H. Hawker, Altoona	Otter creek	2,000
L. A. McKinley, Altoona	Nine-mile creek	2,000
Geo. Palmer, Altoona	Big Nine-mile creek	2,000
Wm. C. Johnson, Eau Claire	Elk creek	4,000
W. H. Willard, Eau Claire	Elk creek	2,000
A. J. Ramharter, Eau Claire	Otter creek	4,000
Herman Schueler, Eau Claire	Coon creek	2,000
H. J. Klofanda, Eau Claire	Nine-mile creek	2,000
W. J. Davis, Eau Claire	Little Elk creek	2,000
W. E. Wahl, Eau Claire	Rock creek	2,000
S. B. Kirkoff, Eau Claire	Mitchell creek	2,000
P. R. Peterson, Eau Claire	Rock creek	2,000
		56,000
FLORENCE COUNTY—		
Ignace Schneider, Iron Mountain	Little Popple river	4,000
Geo. M. Breed, Long Lake	North Branch of Popple river	2,000
Jas. F. Hess, Long Lake	Wood creek	2,000
John G. Gross, Long Lake	Riley creek	2,000
M. B. Magaurn, Long Lake	Cold-water creek	2,000
E. W. Hopkins, Commonwealth	Anderson creek	4,000
H. P. Chambers, Florence	Brule river	4,000
J. E. Perry, Florence	La Page creek	4,000
		24,000
FOND DU LAC COUNTY—		
E. S. Pedrick, Ripon	Silver creek	2,000
Harry Cody, Ripon	Wakefield creek	4,000
R. E. Schallein, Ripon	Dakin creek	2,000
Jas. L. Stone, Ripon	Roy creek	2,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
FOND DU LAC COUNTY—Continued.		
H. A. Ripley, Oakfield	East Branch of Fond du Lac river	4,000
Everrett G. Tulledge, Oakfield	Spring Tributary to Fond du Lac river	4,000
Thomas H. O'Brien, Fond du Lac	Camp-ground stream	2,000
F. J. Rueping, Fond du Lac	Parsons stream	2,000
R. B. Born, Fond du Lac	Byron creek	2,000
L. J. Justen, Fond du Lac	Mulvey stream	2,000
Arthur Seresse, Fond du Lac	Straub creek	2,000
H. S. Miller, Fond du Lac	Camp-ground creek	4,000
		32,000
FOREST COUNTY—		
J. L. Schacher, Crandon	Hemlock creek	4,000
L. T. Crabtree, Crandon	Drake creek	4,000
E. Hemenway & Co., Carter	Torphy creek	2,000
Ernest Mastin, Carter	Tributary Oconto river	2,000
David Bowman, Carter	Tributary Torphy creek	2,000
Phil. Mielke, Carter	South Branch of Torphy creek	2,000
Wm. Collins, Carter	Miner creek	2,000
Chet. Starks, Laona	Tributaries of Rat river	2,000
R. S. Elliott, Laona	Tributary to Rat river	2,000
D. W. Connor, Laona	Peshtigo river	4,000
Connor Lbr. & Land Co., Laona	Rat river	2,000
H. R. Messer, Laona	Riley creek	2,000
Flanner-Stiger Lbr. Co., Blackwell	Blackwell creek	4,000
H. W. Baldwin, Green Bay	North Branch of Pike creek	4,000
M. Feser, Green Bay	Armstrong creek	4,000
W. E. Fairchild, Green Bay	Armstrong creek	4,000
		46,000
GRANT COUNTY—		
Henry F. Schmitt, Livingston	Martinville Branch of Platte river	4,000
R. C. Livingston, Livingston	Martinville Branch of Platte river	2,000
John Buben, Fennimore	Coon branch	4,000
Irvin J. Carter, Lancaster	Willow branch	2,000
N. J. Tiedmans, Lancaster	McPherson creek	2,000
F. W. Halberty, Lancaster	Pigeon creek	2,000
Louis J. Starr, Lancaster	Austin creek	2,000
H. Searles, Lancaster	Borah branch	2,000
H. S. Rhodes, Lancaster	Walker branch	2,000
Frank Postel, Muscoda	Coon creek	2,000
V. L. Morisette, Muscoda	Six-mile creek	2,000
Wm. Gellar, Muscoda	Indian creek	2,000
Theo. Hueppler, Muscoda	Booth-hollow creek	2,000
John O. Postel, Muscoda	Sand branch	2,000
W. G. Palmer, Boscobel	Wannamaker creek	4,000
F. W. Schmitt, Boscobel	Buben branch and Sanders creek	4,000
Fred Foster, Woodman	Millville creek	4,000
F. C. Lewis, Bridgeport	Bridgeport-hollow creek	4,000
		48,000
GREEN LAKE COUNTY—		
Fred Soper, Green Lake	Bacon creek	4,000
IOWA COUNTY—		
R. E. Gubble, Dodgeville	Cox Hollow	2,000
H. D. James, Dodgeville	Anderson creek	2,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
IOWA COUNTY—Continued.		
Geo. Parsons, Dodgeville	Jewell stream	2,000
F. J. Bilky, Dodgeville	Williams branch	2,000
Nels Lee, Dodgeville	Reagans branch	2,000
Wm. Miller, Dodgeville	Meyers creek	2,000
F. A. Metcalf, Dodgeville	Flint creek	2,000
Arthur R. Jones, Dodgeville	Brethlens creek	2,000
Henry Hanson, Spring Green	Branch of Wyoming creek	2,000
M. C. McIntyre, Avoca	Swinehart creek	4,000
A. Apple, Mineral Point	McKinney creek	2,000
F. M. Priestly, Mineral Point	McKinney creek	4,000
H. J. Kiefer, Mineral Point	Graffer creek	2,000
James Mulhairn, Mineral Point	Dodge creek	2,000
Josiah Lanyon, Mineral Point	Lerry branch	2,000
Wm. Lanyon, Mineral Point	Harker stream	2,000
		36,000
IRON COUNTY—		
Geo. C. Foster, Hurley	Montreal river	4,000
M. J. Connors, Hurley	West branch of Montreal river	4,000
J. H. Lawlor, Hurley	Spring creek	4,000
J. S. Eaver, Pence	Montreal river and Tribs.	4,000
Horace Fountain, Saxon	Fochie creek	4,000
Chas. R. Clark, Kimball	Crystal brook and Rolling Trout creek	4,000
Dan'l Shay, Mercer		4,000
		28,000
JACKSON COUNTY—		
R. K. Frost, Millston	North Fork Robinson creek.	2,000
M. S. Pitts, Millston	Head Waters Robinson creek.	2,000
Wm. Zaharte, Sr., Warrens	Wyman's creek	2,000
Wm. Smothers, Warrens	Wyman's creek	2,000
Walter Wright, Black River Falls	Silver creek	2,000
R. A. Jones, Black River Falls	Town creek	2,000
S. D. Blake, Black River Falls	Allens creek	2,000
John Niederer, Black River Falls	Pappoose creek	2,000
Geo. F. Cooper, Black River Falls	Slosser Branch, Squaw creek	2,000
L. J. Taggart, Black River Falls	Stennlson branch, Squaw creek	2,000
John H. Miles, Black River Falls	Kenyon Branch, Squaw creek	2,000
H. J. Gebhardt, Black River Falls	Perry creek	2,000
J. W. Cole, Black River Falls	Allens creek	2,000
F. W. Cole, Black River Falls	Town creek	2,000
David Gaylord, Merrillan	Arnold's creek	2,000
E. E. Moore, Merrillan	Halls creek	2,000
Harry Sutton, Merrillan	Cisna creek	2,000
J. H. Stiehl, Merrillan	Hall creek	2,000
P. M. Richards, Merrillan	Visnow creek	2,000
Fred J. Sheffer, Hixton	Branch of Lenelle creek	2,000
J. B. Miller, Alma Center	Town creek	2,000
Perlie Bacon, Alma Center	Bacon creek	2,000
C. B. V. Gordon, Alma Center	South branch	2,000
Larry Johnson, Hixton	South Fork Pigeon creek	2,000
L. P. Lanning, Hixton	Pigeon creek	2,000
W. E. Pratt, Hixton	Beity creek	2,000
M. M. Pratt, Hixton	Schemerhorn creek	2,000
W. E. Abbott, Hixton	Amo creek	2,000
W. Strombery, Hixton	Mason creek	2,000
		58,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
JEFFERSON COUNTY—		
Albert Schaller, Waterloo	Strong brook	4,000
JUNEAU COUNTY—		
John B. Edwards, Mauston	Seven-mile creek	4,000
A. J. Hageman, Mauston	Brewers creek	2,000
O. F. Headstream, Mauston	Mile creek	4,000
E. S. Wetherby, Mauston	North Fork of One-mile creek	2,000
A. D. Gill, Mauston	Hyde and Ward creeks	2,000
V. D. Heath, New Lisbon	Valrick and Gebhardt creeks.	4,000
Geo. F. Frohmader, Camp Douglas	Anthony creek	2,000
S. E. Gleason, Camp Douglas	Little Fountain creek	2,000
John Habelman, Oak Dale	Tug Hollow brook	2,000
Cecil J. Philips, Camp Douglas	Servan creek	2,000
R. C. Falconer, Camp Douglas	Hoton creek	4,000
H. O. Peterson, Necedah	Dead-horse creek	2,000
C. W. Wood, Necedah	Schoonover creek	2,000
H. G. Bridgeman, Necedah	Uris creek	2,000
R. A. Wright, Friendship	Cool and Rapleye creeks	4,000
F. McCormick, Friendship	South Branch of Roch a Cri creek	2,000
E. H. Townsend, New Lisbon	McComber and Brewer creeks	8,000
C. E. Bartholf, Elroy	Moose creek	2,000
Wm. T. Teffer, Elroy	Telfer brook	2,000
John Garvin, Elroy	Mile creek	2,000
Chas. C. Chase, Elroy	Mile creek	2,000
J. J. Owens, Elroy	Chard spring	2,000
John H. Mutch, Elroy	Brewer creek	2,000
		62,000
LA CROSSE COUNTY—		
R. O. Vaughn, Bangor	Big and Burns creek	4,000
Wm. A. Smith, Bangor	Big and Burns creek	6,000
John Hatz, Bangor	Dutch creek	4,000
Casper Anderegg, La Crosse	Mormon-coulee creek	4,000
G. F. Hauser, La Crosse	Sand-coulee creek	4,000
Fred Oehler, La Crosse	Chipmonk creek	4,000
		26,000
LAFAYETTE COUNTY—		
M. P. Kennedy, Gratiot	Wolf creek and Trout brook	4,000
Chas. Blanchard, Blanchardville	Kittleson creek	4,000
J. Blanchard, Blanchardville	Lee creek	6,000
L. A. Hazeltine, Argyle	Brennan creek	4,000
F. C. Muenich, Argyle	Apple branch	4,000
		22,000
LANGLADE COUNTY—		
Andrew Huhl, Parrish	Prairie river	2,000
A. Hurlbutt, Parrish	Prairie river	2,000
E. E. Hurlburt, Parrish	Prairie river	2,000
Martin Anderson, Parrish	Prairie river	2,000
Joseph R. Sheriff, Antigo	Branch of Eau Claire river	4,000
Fred Hayssen, Antigo	Spring brook	4,000
Charles Schotte, Antigo	Spring brook	4,000
John Kaufman, Phlox	Red river	4,000
S. H. Ashton, Rhinelander	Tribs. to Eau Claire river	2,000
E. C. Vessey, Rhinelander	Tribs. to Eau Claire river	2,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
LANGLADE COUNTY—Continued.		
J. J. Reardon, Rhinelander	West Branch Eau Claire river	4,000
W. B. La Salle, Rhinelander	Clear brook	2,000
R. C. Dauton, Rhinelander	East Branch Eau Claire river	4,000
G. J. Quigley, Antigo	Spring brook and Tributaries	8,000
		46,000
LINCOLN COUNTY—		
A. T. Curtis, Merrill	Pine river	2,000
A. J. Stange, Merrill	Prairie river	2,000
Dr. Hirscher, Merrill	Pine river	2,000
Thos. C. Olson, Merrill	Pine river	2,000
Frank Doering, Merrill	North Branch of Pine river	2,000
C. N. Johnson, Merrill	Prairie river	2,000
Julius Thielman, Merrill	Spring creek	2,000
F. J. Metcalf, Merrill	Spring creek	2,000
F. W. Kubasta, Merrill	Spring creek	4,000
		20,000
MANITOWOC COUNTY—		
Geo. McLaughlin, Manitowoc	Manitowoc creek and Pigeon river	6,000
Christ Muth, Manitowoc	Herman creek	4,000
Albert Arens, Cooperstown	West Twin river	4,000
Anton E. Reif, Whitelaw	Branch river	4,000
John Reznickek, Whitelaw	Branch river	2,000
		20,000
MARATHON COUNTY—		
Frank Chase, Wausau	Moe brook	4,000
John Winetzki, Wausau	Blank and Sand creeks	4,000
Henry Lueck, Wausau	Einer creek	4,000
Wm. A. Ranka, Norrie	Trout creek	2,000
H. H. Clausen, Norrie	Trout creek	2,000
Neal Brown, Wausau	Plover river	22,000
Ben Umhoefer, Fenwood	Schumaker and Whitney creeks	4,000
		42,000
MARINETTE COUNTY—		
I. W. Stephenson, Marinette	Thunder river and Branches.	4,000
Geo. H. Hartwell, Criitz	Peterman brook	4,000
Joseph Duxbury, Marinette	Gravelly brook	4,000
A. T. Fairchild, Marinette	Small Branch Pike river	6,000
E. Judson Baker, Marinette	Little Pemene creek	4,000
James C. Morgan, Wausaukee	North Inlet Holmes creek and Cold-water brook	6,000
John Underwood, Wausaukee	Little Wausaukee	6,000
H. C. Rector, Athelstane	Meadow brook, Big Eagle and Twin brooks	6,000
Alex Charles, Pound	Bowen creek	4,000
B. Gissenaas, Pound	South Branch Beaver river	4,000
Andrew Bolander, Amberg	South Pike river	4,000
Ernest Butts, Amberg	Little South Branch of Pike river	4,000
Harvey England, Pembine	Tributary to North Branch of Pembine river	4,000
Edwin M. Slye, Pembine	Pembine creek and Tribs.	4,000
Jos. Gravel, Pembine	Pembine creek	2,000
Jos. Therien, Niagara	North Branch Pembine creek.	4,000
		72,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
MARQUETTE COUNTY—		
John Keal, Oxford	Keack creek	2,000
Henry Ward, Oxford	Waite creek	2,000
H. M. Ogle, Oxford	McNutt creek	2,000
Ole Sorrenson, Oxford	Neenah creek and Tribs.	6,000
F. W. Meinke, Westfield	Schatzke creek: head, Montello river	8,000
C. W. Daye, Westfield	Chaffe creek	4,000
		24,000
MONROE COUNTY—		
W. H. Licht, Tomah	Little Sparta creek	2,000
Peter Komisky, Tomah	Mud creek	2,000
W. E. Bossard, Tomah	La Crosse river	2,000
C. J. Wells, Tomah	Brandy creek	4,000
Geo. P. Stevens, Tomah	Little Silver creek	2,000
C. J. Maxwell, Tomah	Council creek	2,000
C. R. Bell, Tomah	Silver creek	2,000
B. L. Gillett, Warrens	Sand creek	2,000
W. E. Voss, Warrens	Brandy creek	2,000
F. G. Warren, Warrens	Clear creek	2,000
G. H. Birkholz, Warrens	Milston creek	2,000
W. J. McCanee, Sparta	Beaver creek	4,000
M. A. Stalleck, Sparta	Big creek	6,000
Jennie B. Brandt, Sparta	Head of La Crosse river	6,000
John Bradley, Sparta	Tar creek	4,000
Chas. Marquette, Kendall	Tores creek	4,000
Harry Rogers, Kendall	Tinucan creek	2,000
Chas. W. Waffle, Kendall	Head of Baraboo river	4,000
T. M. Mills, Wilton	Riordans creek	2,000
H. C. Wagner, Wilton	Sims creek	2,000
R. S. Serrurier, Wilton	Slaton creek	2,000
Charles Todd, Wilton	West Branch of Slaton creek.	4,000
Pete Christ, Norwalk	Branch of Morris creek	4,000
John G. Schell, Norwalk	Branch of Morris creek	2,000
S. Sloggy, Ontario	Cook and Brey creeks	6,000
Martin Erickson, Leon	Pleasant Valley and Common Valley creeks	4,000
John Dunwald, Melvina	Little La Crosse river	4,000
Theodore Kowitz, Melvina	Tributary to Little La Crosse river	4,000
R. Bertting, Cashton	Coon creek	2,000
Claus Bertting, Cashton	Coon creek	4,000
		94,000
OCONTO COUNTY—		
John J. Hof, Sobieski	Little Suamico river	4,000
Ed. Hodgins, Gillette	South Branch of Little river	4,000
Joe Kaufman, Oconto Falls	Splinter creek	4,000
F. J. Kilman, Oconto Falls	Little river	4,000
A. Baker, Lakewood	North Branch of Oconto river and Battle creek	4,000
A. W. Rugg, Lakewood	McCarland brook	4,000
Henry H. Hines, Lakewood	Little South Branch of Oconto river	2,000
		26,000
ONEIDA COUNTY—		
David N. Moore, Pelican Lake	Wolf creek	4,000
J. M. Scott, Tripoli	North Branch of Spring creek	4,000
John Zwick, Tripoli	Little Snow creek	4,000
Henry Hanson, Woodruff	Hanson creek	6,000
		18,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
PEPIN COUNTY—		
Albert E. Scruth, Pepin	Bogens creek	4,000
Wm. Engel, Pepin	Sixteenth creek	4,000
August Thies, Pepin	East Branch of Roesing creek	4,000
Wm. Rumbach, Durand	O'Ladys creek	4,000
N. A. Keyes, Durand	Clear creek	2,000
Burr Turrant, Durand	Bear creek	2,000
Wm. B. Smith, Durand	Bear creek	2,000
Arthur Swartz, Durand	Missouri creek	2,000
Robt. Kraeft, Durand	Fall creek	2,000
B. E. Graves, Eau Galle	Cary creek	2,000
A. C. Huleatt, Arkansaw	Arkansaw creek	4,000
		32,000
PIERCE COUNTY—		
John Halverson, Spring Valley	Streams of North Rush river.	4,000
E. C. Clarey, Maiden Rock	Brush and Lost creeks	4,000
J. Flemming, Maiden Rock	Carson creek	2,000
Henry Albert, Maiden Rock	Double creek	2,000
S. F. Fansler, Plum City	Plum creek and Tributaries...	4,000
J. H. Leach, Plum City	Cave creek	4,000
H. W. Thompson, River Falls	North Branch of Kinnickinnic river	4,000
Rod. S. Williams, River Falls	Tidd and Ney creeks	4,000
C. R. Taggart, River Falls	South Fork of Kinnickinnic river	2,000
E. A. Tobey, River Falls	Kinnickinnic river and Tribs.	4,000
G. W. Cornelison, Ellsworth	Trimbelle creek	2,000
George Gordon, Ellsworth	Trimbelle river	2,000
L. H. Place, Ellsworth	Cave creek	2,000
Henry Bye, Ellsworth	Rush river	2,000
B. G. Reed, Ellsworth	Lost creek	2,000
C. L. Muggah, Ellsworth	Brush creek	2,000
Jos. E. Richter, Elssworth	Cave creek	2,000
H. G. Luke, Ellsworth	Brush creek	2,000
W. D. Smith, Eau Galle	Maple-spring creek	4,000
F. H. Horn, Rock Elm	Big Missouri	2,000
W. C. Condit, Rock Elm	Little Missouri	2,000
E. R. Condit, Rock Elm	Plum creek	2,000
Jay Hawn, Rock Elm	Lost creek	2,000
C. D. Hawn, Rock Elm	Plum creek	2,000
H. B. Bleisner, Spring Valley	Lansey and Loohn creeks	4,000
O. D. Springer, Spring Valley	Gilbert creek	2,000
John H. Graslie, Spring Valley	Trout creek	2,000
C. D. Seiberns, Spring Valley	Lousey creek	2,000
F. G. Eklund, Ellsworth	Big and Little Trimbelle	4,000
		78,000
POLK COUNTY—		
C. C. Ladd, Osceola	Osceola creek	4,000
W. T. Kennedy, Amery	Beaver brook	2,000
H. H. Hart, Amery	South Fork of Bull brook	2,000
S. L. Pennington, Amery	Burns brook	2,000
J. A. Young, Amery	Burns brook	2,000
Peter Peterson, Amery	Friday creek	2,000
W. D. Thompson, Amery	Trib. to White-ash lake	2,000
		16,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
PORTAGE COUNTY—		
S. C. Swenson, Amherst	Sonnes creek	2,000
Thomas C. Keener, Amherst	Brathoode creek	2,000
A. O. Knight, Amherst	Ross creek	2,000
Thomas Anderson, Amherst	Spring creek	2,000
Henry Stoltenberg, Nelsonville	Branch of Waupaca river	4,000
Wm. T. Waller, Nelsonville	Waupaca river	4,000
C. B. Wheelock, Stevens Point	Little Plover river	2,000
Walter Eddy, Stevens Point	Plover river	2,000
C. A. Schenk, Stevens Point	Waupaca river	2,000
John Sukaszewicz, Stevens Point	Little Plover river	2,000
L. A. Humphrey, Stevens Point	Little Plover river	2,000
Geo. Julier, Stevens Point	Little Plover river	2,000
Geo. F. Hebard, Stevens Point	Tomorrow river	2,000
		30,000
PRICE COUNTY—		
O. B. Greene, Kennan	Deer creek	4,000
J. W. Winter, Kennan	Tribs. of Skinner creek	2,000
Prickert Bros., Kennan	Deep creek	2,000
L. M. Reed, Brantwood	Small Spring creek	4,000
B. Cook, Clifford	Squaw creek	4,000
J. E. Feely, Fifield	McKinzie creek	4,000
Patterson Bros., Fifield	Davis creek	4,000
E. J. Marsh, Fifield	Spring creek	2,000
		26,000
RICHLAND COUNTY—		
H. W. Haskell, Lone Rock	Pennsylvania creek	2,000
Alex Ray, Lone Rock	Little Bear creek	2,000
C. S. Fuller, Lone Rock	Marble-quarry creek	2,000
Nels Christensen, Lone Rock	Morey creek	2,000
T. K. Fries, Lone Rock	McCarvel creek	2,000
A. J. Dickerson, Lone Rock	Jackson creek	2,000
R. L. Thurber, Richland Center	Trib. to Buck creek	4,000
Geo. W. Schroeder, Viola	Goose and Cany creek	4,000
C. J. Stormont, Viola	Dutch creek	4,000
Hobe Groves, Viola	Kinder-hollow creek	4,000
		28,000
RUSK COUNTY—		
A. O. St. Clair, Hawkins	Soft-maple creek	2,000
W. A. Lilyquist, Weyerhauser	Hay creek	2,000
G. R. Miller, Weyerhauser	Spring creek	2,000
Mathew Kassela, Weyerhauser	Little Soft-maple creek	2,000
D. E. Getchel, Weyerhauser	Little Potatoe creek	2,000
W. C. Dale, Weyerhauser	Meadow creek	4,000
M. A. Brosions, Weyerhauser	Devil creek	2,000
Archie Barrett, Bruce	Elder creek	2,000
G. H. Williams, Bruce	Willow creek	2,000
H. L. Clark, Ladysmith	Keegan creek	2,000
W. S. Manning, Ladysmith	Hay creek	2,000
Thos. S. Thompson, Ladysmith	Moose-ear creek	2,000
P. S. Kieth, Ladysmith	Mad creek	2,000
E. W. Hill, Ladysmith	Twin creek	2,000
E. W. Mounroe, Ladysmith	Main Deer-tail and meadow creeks	4,000
H. W. True, Glen Flora	Clarence creek	4,000
C. K. Ellingson, Hawkins	Spring brook	4,000
		42,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
ST. CROIX COUNTY—		
Geo. H. Pittman, Baldwin	Kinnickinnick river	4,000
Wm. A. Kay, Spring Valley	Rush river	8,000
R. P. Yale, Glenwood	John's creek	2,000
H. H. Dean, Glenwood	Sand creek	2,000
P. A. Beebe, Glenwood	Blue's creek	2,000
R. A. Cleveland, Glenwood	Sand-spring creek	2,000
John Pearson, Somerset	Trout creek	4,000
W. E. Webester, Hudson	Kinnickinnick river	2,000
Otto W. Arnquist, Hudson	Kinnickinnick river	2,000
Louis Haugen, Hudson	Willow river	2,000
L. G. Green, Hudson	Willow river	2,000
S. W. Bandy, Hudson	Willow river	2,000
H. Harding, Hudson	Willow river	4,000
J. C. Harding, Hudson	Jefferson and Underwood brooks	4,000
C. W. Christensen, Roberts	Kinnickinnick river	2,000
J. A. Vincent, Roberts	Kinnickinnick river	2,000
H. C. Wetterlin, Hammond	Kinnickinnick river	4,000
Geo. G. Wright, Hammond	Kinnickinnick river	4,000
Bert G. Stockman, Woodville	Eau Galle river	4,000
Decker Bros., Woodville	Eau Galle river	4,000
Wm. Ryan, Wilson	Knowles and Hay creeks	4,000
S. C. Boardman, New Richmond	Ten-mile creek	4,000
J. F. Kinne, Boardman	Ten-mile creek	4,000
Thos. Heffron, Boardman	Willow river	4,000
Chas. McKenzie, Burkhardt	Willow river	2,000
Jos. Smith, Burkhardt	Willow river	2,000
Frank Beer, Burkhardt	Willow river	4,000
		86,000
SAUK COUNTY—		
Y. Buehler, Prairie du Sac	Lehmann brook	4,000
B. D. Sherwood, Spring Green	Jones creek	2,000
Frank Simpson, Spring Green	Wilson creek	2,000
Dennis Cummings, Spring Green	Branch of Little Bear creek	2,000
Peter Dietl, Plain	Bauers creek	2,000
Jas. L. Dalling, Baraboo	Otter and Baxter creeks	4,000
Wilber Cahoon, Baraboo	Skillett creek	4,000
F. E. Settergren, Baraboo	Big-Spring creek	4,000
F. A. Foss, Reedsburg	Dell creek	4,000
E. A. Giffert, Reedsburg	Foss creek	4,000
John W. Dearholt, Reedsburg	Trib. of Narrows creek	4,000
		36,000
SAWYER COUNTY—		
C. D. Benack, Hayward	Mosquito brook	4,000
Geo. E. Buckley, Hayward	Namakagon river	2,000
R .C. Pugh, Hayward	Bean brook	2,000
Russel D. Pugh, Hayward	Spider creek	2,000
Jens. Jorgenson, Hayward	Cold brook	2,000
C. B. Jorgenson, Hayward	Coal creek	2,000
C. L. Storey, Hayward	Mosquito creek	2,000
		16,000
SHAWANO COUNTY—		
Joseph A. Ribidean, Phlox	Head of west branch of Red river	2,000
W. B. Dresser, Phlox	West branch of Wolf river	2,000
C. A. Perry, Eland	Trib. South branch of Embarrass river	2,000
Elwin Franklin, Eland Jct.	South branch Embarrass river	4,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
SHAWANO COUNTY—Continued.		
Herman Wiskow, Wittenberg	Middle branch Embarrass river	2,000
Herman F. Jahnke, Regina	North branch Embarrass river	4,000
Frank Kuschel, Wittenberg	South branch Embarrass river	2,000
R. B. Glaubitz, Wittenberg	South branch Embarrass river	2,000
Frank Hitzke, Wittenberg	South branch Embarrass river	2,000
I. L. Rice, Wittenberg	Embarrass river	2,000
J. Lehman & Son, Tigerton	South branch Embarrass river	2,000
John Hoffman, Tigerton	Tigerton creek	2,000
John Foss, Tigerton	Morris creek	2,000
Robt. Petko, Tigerton	Comet creek	2,000
August Schwede, Tigerton	Comet creek	2,000
Wm. Schenck, Shepley	Wilson and Sprague creeks	4,000
Harry Collins, Shawano	Mill creek	4,000
Henry May, Shawano	West branch creek	4,000
A. C. Weber, Shawano	East branch of Evergreen creek	4,000
		50,000
SHEBOYGAN COUNTY—		
August G. Meyers, Howards Grove	Sheboygan river	4,000
R. G. Arnold, Glenbeulah	Becks creek	4,000
B. H. Sanford, Sheboygan Falls	Briggs creek	4,000
H. C. Gruebner, Sheboygan	Osten creek	4,000
		16,000
TREMPEALEAU COUNTY—		
W. P. DeBow, Blair	Voose and Salay coulee creeks	4,000
Henry Amudson, Arcadia	Plum creek	2,000
Gabe Nelson, Whitehall	Plum creek	2,000
Christ Thompson, Independence	Plum creek	2,000
Ray H. Larsen, Arcadia	Plum creek	2,000
James Davis, Arcadia	Davis creek	2,000
F. C. Koening, Arcadia	Sandy creek	2,000
P. Sabotta, Arcadia	Valley Ford creek	2,000
Joe Hild, Arcadia	Beaver creek	2,000
M. English, Arcadia	English Valley creek	2,000
Thomas Cummings, Arcadia	Hardson Valley creek	2,000
W. E. Muir, Arcadia	Morgan Valley creek	2,000
Fred Gallup, Galesville	Mars and Corrigan creeks	4,000
Gus. Apel, Galesville	Dutch creek	4,000
O. A. Ballom, Osseo	Cox creek	2,000
Geo. W. Raas, Osseo	Crawford creek	2,000
John Lowe, Osseo	John Lowe creek	2,000
T. J. Moe, Osseo	Nelson's creek	2,000
Geo. N. Andrews, Osseo	Moe creek	2,000
G. O. Lindeman, Osseo	Kings creek	2,000
N. E. Bersing, Eleva	Rossman pond	4,000
N. I. Gilbert, Eleva	Big creek	2,000
Matt Holman, Eleva	Adams creek	2,000
A. Amundson, Eleva	Lindsay creek	2,000
		56,000
VERNON COUNTY—		
Lyman Mitchell, Elroy	Hill Prairie creek	4,000
Edgar Eno, Valley	Trib. to Warner creek	2,000
A. W. Curry, Valley	North Warner creek	4,000
Elias Fox, Hillsboro	Small Spring brook	2,000
C. F. Kauffman, Hillsboro	Greenwood and Halefeldt creeks	4,000
Ed. Kellicut, Viola	Elk run	4,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
VERNON COUNTY—Continued.		
Elmer Davis, Viroqua	Harrison branch	2,000
L. A. Larson, Viroqua	West Weister creek	2,000
G. A. Groves, Viroqua	Brush Hollow creek	2,000
A. F. Love, Viroqua	West Kickapoo river	2,000
Ben Eie, Viroqua	See's branch	2,000
E. O. Sveen, Westby	Upper West Fork Kicpapoo river	2,000
Ludwig Neprude, Westby	Sease branch	2,000
Olaf Peterson, Westby	West branch of Kickapoo river	2,000
Haakon Hagen, Westby	West Kickapoo river	2,000
A. Steensen, Westby	Branch Coon creek	2,000
Andrew Lee, Westby	Skaal and creek	2,000
Ernest S. Johnson, Westby	Esofea creek	2,000
G. C. Olson, Westby	North branch of Badax creek	2,000
Carl Johnson, Westby	South branch of Badax creek	2,000
E. Eielson, Westby	Tomten creek	2,000
		50,000
VILAS COUNTY—		
J. W. Lant, Star Lake	Johnson creek	4,000
Chas. Arnson, Star Lake	Hunters creek	4,000
H. E. Salsich, Star Lake	Johnsons creek	4,000
Tom Olson, Star Lake	Browns creek	4,000
Edw. Lacon, Eagle River	Spring creek	4,000
F. Beaulsley, Eagle River	Spring brook	2,000
Jas. Burns, Eagle River	Hay meadow creek	4,000
Fred Morey, Eagle River	Deer-skin creek	4,000
C. W. Rogers, Eagle River	Deer-skin creek	2,000
Chas. A. Phelps, Hackley	Muskrat creek	2,000
Delbert, Hankin, Hackley	Twin creek	2,000
Jas. P. Hobart, Hackley	Deer-skin creek	2,000
Noel St. Louis, Hackley	Alvoy creek, Trib. Brule river	2,000
Hackley Phelps Bonell Co.	Seven-mile creek	2,000
C. A. Scharsch, Hackley	Trib. of Big Twin creek	2,000
Henry Nanny, State Line	Little Portage creek	4,000
Harry G. Frank, State Line	Seeder creek	4,000
David Houle, Three Lakes		6,000
		56,000
WALWORTH COUNTY—		
P. G. Schilling, Whitewater	Harris stream	4,000
Martin Ranf, Whitewater	Whitewater creek	4,000
J. H. Fryer, Whitewater	Bluff creek	2,000
Clarence B. Alrick, Whitewater	Bloodgood stream	2,000
Hugh E. Lindsay, Whitewater	Clover-valley spring brook	4,000
H. D. Barnes, Elkhorn	Spring brook	4,000
W. A. Sharp, Elkhorn	Stream, no-name	2,000
J. A. Collin, Elkhorn	Spring brook	4,000
		26,000
WASHBURN COUNTY—		
John A. Martin, Birchwood	Pigeon creek	2,000
G. F. Andrew, Birchwood	Douris creek	2,000
L. G. Bemis, Birchwood	Sucker creek	2,000
R. Mams, Birchwood	Trout creek	2,000
John Mikinlor, Birchwood	East creek	2,000
Wm. S. Kyle, Birchwood	Hay creek	2,000
W. F. Loomis, Birchwood	Pigeon creek	2,000
F. L. Evers, Shell Lake	Sawyer brook	2,000
A. A. Lovell, Shell Lake	Arbuckle brook	2,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
WASHBURN COUNTY—Continued.		
I. G. Crowell, Shell Lake	Dalkstrom brook	2,000
John McCay, Shell Lake	Sawyer brook	2,000
Wm. E. Closter, Shell Lake	Beaver spring	2,000
W. B. Hanson, Shell Lake	Beaver brook	2,000
Ole Hawkinson, Shell Lake	Dahlstream brook	2,000
J. E. Shaul, Trego	Spring brook	4,000
Thos. H. Fielding, Mills	Potatoe creek	4,000
J. J. Hohl, Minong	Frog and Shell creek	4,000
A. E. Adams, Minong	Chicago brook	2,000
Ira B. Cartwright, Minong	Shell creek	2,000
John Smith, Trego	Gull creek	2,000
J. H. Bixby, Trego	Potatoe creek	4,000
C. H. Dexter, Spooner	Mud creek	4,000
Fred Wesenberg, Anah	Allens creek	4,000
		58,000
WASHINGTON COUNTY—		
J. F. Smith, Fond du Lac	Hamilton-spring creek	4,000
Carl Klahn, Barton	Klahn-spring creek	2,000
John Campbell, Barton	Campbell-spring creek	2,000
Tony Kicker, Barton	Spring creek	2,000
		10,000
WAUKESHA COUNTY—		
W. H. Tuohy, Eagle	Eagle Spring creek	4,000
D. H. Bergh, Eagle	Bottomly creek	2,000
James P. Doulan, Eagle	Jericho creek	4,000
H. E. Salsich, Hartland	Upper Bark river	4,000
C. W. Peterson, Hartland	Creek running into Pewaukee lake	4,000
J. F. Dittrich, Oconomowoc	Smith spring	2,000
Chas. Benton, Oconomowoc	Waterville creek	2,000
W. G. Race, Oconomowoc	North Lake creek	2,000
C. J. Shaver, Oconomowoc	North branch Oconomowoc river	2,000
H. C. Lampson, Oconomowoc	Klink creek	2,000
Killie Dick, Waukesha	Fausthouse creek	4,000
F. B. Dreyer, Wales	Crow creek	4,000
Griff R. Jones, Wales	Jones creek	4,000
Phil H. Jones, Wales	Jones creeek	2,000
		42,000
WAUPACA COUNTY—		
J. E. Phillips, Iola	South branch of Wolf river	4,000
C. H. Nelson, Iola	Nelson creek	2,000
J. C. Lang, Iola	South branch of Little Wolf river	2,000
A. P. Swenson, Iola	Iola creek	2,000
E. E. Browne, Waupaca	Radley and Dayton creeks	4,000
J. E. Jardine, Waupaca	Austin creek	2,000
Chas. Bomers, Waupaca	Emmons creek	2,000
H. D. Bemis, Waupaca	McLean creek	2,000
Fred George, Waupaca	Keeley brook	2,000
James Grant, Almond	Grant creek	2,000
B. L. Seefer, Sheridan	Waupaca river	2,000
P. C. Jensen, Sheridan	Waupaca river and Tribs.	2,000
G. B. Root, Sheridan	Waupaca river and Tribs.	2,000
John Durrant, Sheridan	Waupaca river	2,000
H. G. Folkman, Clintonville	Hyde creek	2,000
Albert Schmiedeke, Clintonville	Spring brook	2,000

Distribution of Fish.

BROOK TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
WAUPACA COUNTY—Continued.		
Levi. C. Larson, Clintonville	North branch of Pigeon creek	2,000
S. H. Rondeau, Clintonville	South branch of Pigeon creek	2,000
R. Schmiedeke, Clintonville	Herman brook	2,000
		42,000
WAUSHARA COUNTY—		
Owen Goodwin, Neshkoro	Birch creek	4,000
John M. Koeser, Red Granite	Willow and Cedar creeks	4,000
E. F. Kileen, Wautoma	White river	2,000
F. S. Durham, Wautoma	Bird creek	2,000
Ole I. Thorstad, Wautoma	Thorstad creek	2,000
Guy Mumbrue, Wautoma	Pine creek	2,000
E. L. Benjamin, Neshkoro	Alder and Poplar creeks	4,000
A. J. Stevens, Wild Rose	Pine river	4,000
J. C. Pierce, Wild Rose	Willow river	4,000
J. V. Berens, Wild Rose	Pine river	2,000
E. J. Hughes, Wild Rose	Pine river	4,000
W. A. Roblier, Coloma Station	Little Roche a Cri creek	2,000
H. F. Bartz, Coloma Station	Runnels creek	2,000
Wm. F. Curran, Coloma Station	Chaffe creek	2,000
Peter Moore, Coloma Station	Chaffe creek	2,000
Scott, Runnels, Coloma Station	Wedde creek	2,000
A. J. Borsack, Coloma Station	Pine creek	2,000
Wm. Smith, Coloma Station	Machan creek	2,000
H. Walker, Hancock	Big Roche a Cri creek	2,000
M. O'Connor, Hancock	Roche a Cri creek	2,000
E. H. Strong, Hancock	Little Roche a Cri creek	2,000
M. Garrison, Hancock	Little Mecan river	2,000
A. Hebblewhite, Hancock	Chaffe creek	2,000
Edd. O'Connor, Hancock	Little Roche a Cri creek	4,000
		62,000
WOOD COUNTY—		
Emil S. Kliner, Marshfield	Squaw creek	4,000
Wm. H. Burchell, Grand Rapids	Wakely creek	2,000
Geo. N. Wood, Grand Rapids	Seven-mile creek	2,000
H. H. Voss, Grand Rapids	Two-mile creek	2,000
Guy R. Wood, Grand Rapids	Six-mile creek	2,000
W. W. Meade, Grand Rapids	Wakely creek	2,000
E. L. Rosseir, Grand Rapids	Chester creek	2,000
H. A. Sampson, Jr., Grand Rapids.	Harvey creek	2,000
A. H. Kleberg, Nekoosa	Seven-mile creek	4,000
		24,000
Total brook trout, advanced fry,	planted 1908	2,272,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
ADAMS COUNTY—		
Chas. H. Gilman, Friendship	Bingham creek	3,000
J. B. Hill, Friendship	Big Roche a Cri creek	3,000
		6,000
ASHLAND COUNTY—		
A. A. Miller, Highbridge	Silver creek	8,000
J. Steffeck, Mellen	Bad river	4,000
J. M. Mahon, Mellen	McCartys creek	4,000
J. P. Trumbly, Mellen	Creek in Sec. 8, T. 55, R. 2 W.	4,000
J. O. Donahue, Mellen	Devils creek	4,000
L. A. Vought, Mellen	Trib. to Tyler Forks	4,000
D. F. Tyler, Glidden	East Fork of Chippewa Crossing	4,000
Hugo Schmidt, Glidden	Head of Moose river	4,000
Sam. Kubley, Glidden	Head of Moose river	4,000
Peter Gerhardt, Glidden	Dryden creek	4,000
Frank Rogers, Glidden	Head of Torch river	4,000
T. R. Yankee, Ashland	Butternut creek	12,000
		60,000
BARRON COUNTY—		
M. J. Berg, Barron	Johnson creek	4,000
Arthur E. Coe, Barron	Inaderer creek	4,000
H. P. Peterson, Cumberland	Sand creek	4,000
W. N. Fuller, Cumberland	McKenzie brook	4,000
A. H. Miller, Cumberland	Miller creek	2,000
H. S. Comstock, Cumberland	South Fork Clam river	4,000
W. G. Miller Cumberland	Hay river	2,000
G. L. Luff, Cumberland	Hickey creek	2,000
A. F. Wright, Cumberland	Scott's creek	2,000
Nick B. Nelson, Cumberland	Anderson spring	2,000
L. E. Griswold, Turtle Lake	Turtle creek	4,000
A. O. Blix, Turtle Lake	Hillmans lake	4,000
J. H. Bunker, Turtle Lake	Turtle creek	4,000
A. Rosenbush, Turtle Lake	Apple river	4,000
D. S. Wallace, Turtle Lake	Smith creek	4,000
E. G. Brown, Hillsdale	Dorety creek	4,000
J. H. Kilmer, Hillsdale	Little four-mile creek	4,000
H. W. Carr, Hillsdale	Upper Pine creek	4,000
F. F. Dorey, Dallas	Little Pine creek	4,000
James B. Carter, Rice Lake	Spring creek	6,000
Fred Chranz, Rice Lake	Eugeles creek	6,000
Chas. Sail, Rice Lake	Trib. of Red Cedar river	8,000
		86,000
BAYFIELD COUNTY—		
Albert Nemec, Cable	Capt. Garrison's creek	4,000
M. C. Tomkins, Ashland	Pine creek	4,000
Albert Nelson, Bayfield	Raspberry river	8,000
J. A. Pettingill, Iron River	Iron river and branches	4,000
H. O. Lund, Iron River	Reefer creek	8,000
C. V. Clark, Iron River	Musquay brook	4,000
A. H. Miles, Iron River	Iron river and Tribs.	4,000
N. C. Drew, Cusson	Little Trout Spring lake	8,000
Theo. Anderson, Cusson	West Fork of White river	8,000
D. H. Hubbard, Cusson	East Fork of White river	8,000
		60,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
BROWN COUNTY—		
A. J. Wilnarnes, Greenleaf	Easton Devil river	3,000
Rowland T. Burdon, Green Bay	Serills creek and Tribs.	3,000
W. E. Burdeau, Flintville	Suamico and Branch rivers	6,000
		12,000
BURNETTE COUNTY—		
E. F. Bunker, Grantsburg	Hay creek	3,000
John E. Burgan, Grantsburg	Hay creek	3,000
Newton Hickerson, Grantsburg	Wood river	3,000
P. D. Hickerson, Grantsburg	Wood river	3,000
Bert Hickerson, Grantsburg	Wood river	3,000
		15,000
CHIPPEWA COUNTY—		
Joe Walsdorf, Stanley	Rogers creek	3,000
F. M. Craig, Stanley	Trout creek	3,000
John E. Shafer, Stanley	North Fork of Eau Claire river	3,000
K. Morehouse, Stanley	Jung river	3,000
C. F. Millers, Cadott	Arkrite and Paur creeks	3,000
Ben Dietrich, Cadott	Pane creek	3,000
L. S. Kearney, Hannibal	Weasel creek	3,000
D. L. Mohr, Hannibal	Head waters of Fisher river.	3,000
G. L. Sowle, Cornell	Cornell brook	3,000
E. L. Hawn, Ruby	Fisher river and small inlets.	3,000
F. W. Jenkin, Chippewa Falls	Kehls pond on Duncan creek	10,000
		40,000
CLARK COUNTY—		
Geo. K. Redmond, Neillsville	Mound creek	3,000
Hugh Barrett, Neillsville	Cawley creek	3,000
R. H. Treat, Abbotsford	Dill creek	3,000
H. J. Pessig, Curtiss	Ditthneir and Hanson creeks.	3,000
J. E. Ambrose, Owen	North Fork of Popple river	6,000
W. S. Wood, Withee	Black river	6,000
M. D. Garrison, Thorp	Goggle Eye and Chapman creeks	3,000
Geo. B. Parkhill, Thorp	Courter and Sterling creeks	6,000
H. O. Froland, Dorchester	Branch of North Fork of Popel river	16,000
R. H. Treat, Abbotsford	Porcupine creek	10,000
		59,000
COLUMBIA COUNTY—		
Mrs. Dan'l. Benttley, Poynette	Rocky run	3,000
A. J. Klenert, Portage	French creek	3,000
O. A. Sasada, Randolph	Sasada creek	3,000
W. F. Esch, Lodi	Freuer's creek	1,500
W. T. Sparks, Lodi	Bowman's creek	1,500
S. T. Oerbeck, Lodi	Miller creek	1,500
J. F. Collin, Lodi	Spring creek	1,500
		15,000
CRAWFORD COUNTY—		
Geo. H. Davidson, Soldiers Grove	Soldiers Grove and Trout creeks	15,000
J. W. Shaw, Boscobel	Richland creek	3,000
Chas. W. O'Neil, Bridgeport	Hicklin-hollow creek	3,000
		21,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
DANE COUNTY—		
Herman Festge, Cross Plains	Black Earth creek	3,000
Frank Shipley, Cross Plains	Head of Black Earth creek	3,000
A. T. Gafke, Oregon	Bad Fish river	3,000
Frank Spaulding, Windsor	Trib. of Token creek	3,000
		12,000
DODGE COUNTY—		
Geo. W. Bagley, Neosho	Neosho mill-pond	3,000
Eugene Ziegler, Mayville	Rock river	3,000
		6,000
DOUGLAS COUNTY—		
J. M. Crawford, Superior	Half-way lake	6,000
R. J. Nye, Superior	Bubar lake	6,000
F. B. Jerrard, Superior	Bubar lake	4,000
Ernest A. Arnold, Superior	Crotty brook	2,000
Steve Sullivan, Solon Springs	Brule river	4,000
P. E. Waterbury, Solon Springs	Ox creek	2,000
Nicholas Lucius, Jr., Solon Springs	Rock creek	2,000
J. M. Sayles, Solon Springs	Rock creek	2,000
Max. Weichelt, Solon Springs	Crotty creek	2,000
L. M. Coleman, Solon Springs	Arnolds brook	2,000
Francis Patte, Solon Springs	Shillings creek	2,000
E. J. Favell, Solon Springs	Brule river	2,000
A. L. Lord, Solon Springs	Leo creek	2,000
Richard Bennett, Bennett	Middle river	4,000
Peter Heinz, Wascott	Spring brook	4,000
Louis Anderson, Superior	Poplar river	4,000
A. N. Anderberg, Superior	Poplar river	4,000
W. J. Conness, Brule	Sandy river	4,000
		58,000
DUNN COUNTY—		
A. Pillsbury, Menomonie	Wilson creek	3,000
C. H. Anderson, Albertville	Little Elk creek	3,000
Martin Lefstad, Wheeler	King creek	1,500
Dell Stroup, Wheeler	Little Otter creek	1,500
R. R. Porter, Wheeler	Big Beaver creek	3,000
G. C. Greenwood, Wheeler	Big Beaver creek	1,500
B. F. Breitengross, Wheeler	Blank creek	1,500
A. H. Breitengross, Wheeler	La Farge creek	3,000
Geo. E. Scott, Prairie Farm	Turtle creek	3,000
Earl Applebys, Boyceville	Tiffany river	6,000
Geo. R. Topliss, Eau Galle	Eau Galle river	4,500
A. L. Knapton, Ridgeland	Beaver creek	4,000
C. A. Lee, Ridgeland	Hay creek	4,000
I. Sprague, Ridgeland	Vance creek	4,000
		43,000
EAU CLAIRE COUNTY—		
I. Shoudy, Fairchild	Several Tribs. of North Fork of Eau Claire river	6,000
H. J. Swanke, Fall Creek	Beaver creek	3,000
Geo. Palmer, Altoona	Otter creek	3,000
W. J. Davis, Eau Claire	Does and Clear creeks	4,500
Anton Hanson, Eau Claire	Eau Claire river	3,000
Wm. Rydell, Eau Claire	Eau Claire river	3,000
W. H. Brady, Eau Claire	Otter creek	3,000
J. W. Pepper, Eau Claire	Lake Halley	3,000
		28,500

A SHADY NOOK, WILD ROSE HATCHERY.

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
FLORENCE COUNTY—		
Alons Amunson, Fence	Mud creek	4,000
C. E. Steel, Armstrong creek	Mud creek	4,000
James McLain, Armstrong Creek	Mud creek	4,000
		12,000
FOND DU LAC COUNTY—		
Fred J. Griffith, Fairwater	Grand river	3,000
Robert A. Lambert, Ripon	Powell creek	3,000
T. E. Price, Oakfield	Trib. to Upper Branch of Fond du Lac river	3,000
W. F. Sommerfield, Oakfield	Upper Branch of Fond du Lac river	1,500
G. W. White, Oakfield	West Branch of Fond du Lac river	1,500
F. L. Culver, Oakfield	Upper Branch of Fond du Lac river	1,500
B. E. Town, Oakfield	East Branch of Fond du Lac river	1,500
		15,000
FOREST COUNTY—		
Chet. Starks, Laona	Rat river	3,000
R. S. Elliott, Laona	Trib. to Rat river	3,000
Jos. J. Martin, Laona	Trib. to Rat river	3,000
Connor Lbr. & Land Co., Laona	Tribs. to Rat river	3,000
D. W. Connor, Laona	Rat river	3,000
H. R. Messer, Laona	Riley creek	3,000
Fred J. Rogers, Nashville	Spring creek	3,000
C. G. Eaton, North Crandon	North Branch Peshtigo river.	16,000
W. E. Fairchild, Green Bay	Armstrong creek	8,000
M. Feser, Green Bay	Armstrong creek	10,000
		55,000
GRANT COUNTY—		
R. W. Peters, Blue River	Hungerford creek	3,000
H. S. Rhodes, Lancaster	Walker branch	1,500
H. Searles, Lancaster	Borah branch	1,500
Robt. Draper, Lancaster	Vandenall creek	1,500
Louis J. Starr, Lancaster	Austin creek	1,500
F. W. Halferty, Lancaster	Pigeon creek	1,500
N. J. Tiedeman, Lancaster	McPherson's creek	1,500
John W. Brackett, Lancaster	Austin branch	1,500
John Decker, Lancaster	Toollope branch	1,500
Warden Stephens, Fennimore	Blue river and branches	3,000
J. W. Butham, Fennimore	Green river	3,000
		21,000
GREEN LAKE COUNTY—		
F. W. Lambrecht, Berlin	Pine river	3,000
IOWA COUNTY—		
M. C. McIntyre, Avoca	Swinehart creek	3,000
A. Apple, Mineral Point	McKinnes creek	3,000
H. J. Kieffer, Mineral Point	Graffer and Lynch creeks	3,000
James Mulhairn, Mineral Point	Harker creek	1,500
Josiah Lanyon, Jr., Mineral Point	Lerry branch	1,500
Wm. Lanyon, Jr., Mineral Point	Spitzbark creek	1,500
J. A. Messerole, Mineral Point	Otter creek	1,500
Wm. N. Miller, Dodgeville	Pedlar creek	3,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
IOWA COUNTY—Continued.		
Fred Jewell, Dodgeville	Head Pecatonica river	3,000
J. M. Reese, Dodgeville	Vennig creek	3,000
H. D. James, Dodgeville	Regan stream	3,000
Maurice Toay, Dodgeville	Cox-hollow stream	3,000
		30,000
IRON COUNTY—		
B. Morsman, Upson	Spring creek	8,000
Wm. Sherman, Manitowish	Spring and French creeks	8,000
Calvin Doriot, Manitowish	Pappose creek	4,000
Chas. R. Clark, Kimball	Crystal brook and Rolling Trout creek	4,000
J. C. Withington, Mercer	Turtle Waters and river	4,000
Fred Davis, Mercer	Pike Lake creek	4,000
Fayette L. Buck, Divide	Head Waters of Turtle river	4,000
Henry Meade, Hurley	Trout creek	4,000
Geo. C. Foster, Hurley	Montreal river	4,000
M. J. Connors, Hurley	West Montreal river	4,000
J. W. Hawler, Hurley	Spring creek	4,000
J. C. Eaver, Pence	Montreal river and Tribs	4,000
		56,000
JACKSON COUNTY—		
I. W. Cole, Black River Falls	Allens creek	3,000
F. W. Cole, Black River Falls	Town creek	3,000
I. Bowman, Black River Falls	Squaw creek	3,000
F. R. Baker, Black River Falls	Dickey creek	1,500
Chas. P. Baker, Black River Falls	Dickey creek	1,500
Gay R. Sechler, Sechleville	Sly creek	3,000
James Chatt, Sechleville	Love creek	3,000
		18,000
JEFFERSON COUNTY—		
John W. Uglow, Jefferson	Birds brook	3,000
JUNEAU COUNTY—		
H. J. Hageman, Mauston	Mile creek	3,000
E. S. Wetherby, Mauston	One-mile creek	3,000
John Seebecker, Mauston	Head-mile creek	1,500
M. O. Loomis, Mauston	One-mile creek	1,500
Wm. G. Phoenix, Elroy	North Branch Baraboo river	3,000
Cecil J. Phillips, Camp Douglas	Little Lemonweir river	3,000
W. S. Hess, Necedah	White creek	3,000
		18,000
KEWAUNEE COUNTY—		
John Barta, Casco	Casco creek	4,500
J. H. Rooney, Casco	Little Scarbora river	3,000
M. J. Simanek, Kewaunee	East Branch of East Two rivers	4,500
Joseph Musil, Kewaunee	Clyde brook	4,500
Anton Defuch, Kewaunee	Decker creek	3,000
Ernest Bruemmer, Algoma	South Branch of Ahnapee river	3,000
		22,500
LA CROSSE COUNTY—		
Casper Anderegg, La Crosse	Mormon Coulee creek	6,000
John F. Oehler, La Crosse	Weir's creek	3,000
		9,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
LAFAYETTE COUNTY—		
Chas. Blanchard, Blanchardville	Hordan creek	1,500
Carl Chandler, Blanchardville	Pecatonica river	1,500
Jas. Blanchard, Blanchardville	Blue Mounds river	1,500
Geo. H. Gould, Blanchardville	Thomas creek	1,500
W. C. Uren, Blanchardville	Dugville creek	1,500
E. Regez, Blanchardville	Tribs. Pecatonica river	1,500
		9,000
LANGLADE COUNTY—		
Charles Schotte, Antigo	Eau Claire river	3,000
Fred Hayssen, Antigo	Spring brook	3,000
H. V. Mills, Antigo	Eau Claire river	3,000
C. L. Leykom, Antigo	Eau Claire river	3,000
G. J. Quigley, Antigo	Spring brook and Tribs.	7,500
		19,500
LINCOLN COUNTY—		
A. G. Adams, Merrill	Prairie river	1,500
Chas. Mars, Merrill	Little Hay Meadow creek	1,500
Emil Rohrform, Merrill	Little Hay Meadow creek	1,500
A. W. Koehler, Merrill	Prairie river	1,500
N. M. Knudson, Merrill	Pine river	3,000
Albert Witte, Merrill	Little Hay Meadow creek	3,000
Gottlief Schroeder, Merrill	Prairie river	3,000
H. Hoover, Heineman	North Branch of Prairie river	1,500
Jos. Yanda, Jr., Heineman	Prairie river	1,500
H. H. Heineman, Heineman	Hay Meadow creek	1,500
John Pospisiel, Heineman	Prairie river	3,000
C. M. Christiansen, Heineman	Prairie river	3,000
R. T. Hanover, Heineman	Hay Meadow creek	3,000
C. L. Stephens, Heineman	Prairie river	3,000
J. C. Horgen, Irma	Pine creek	7,500
Luie A. Miller, Dudley	Prairie river	3,000
Thomas E. Nash, Tomahawk	Spring brook	3,000
A. W. Knages, Tomahawk	Silver Spring creek	1,500
Mrs. T. E. Nash, Tomahawk	Hay creek	1,500
William Drever, Tomahawk	Silver creek	1,500
Charles A. Rosche, Tomahawk	Spring creek	1,500
Melvin E. Millard, Tomahawk	Trout creek	1,500
B. N. Boorman, Tomahawk	North Branch of Big Pine creek	3,000
J. A. Fitzgerald, Tomahawk	South Branch of Big Pine creek	3,000
		58,500
MANITOWOC COUNTY—		
Alex Bahr, Manitowoc	Schisels lake	4,500
Fred Carns, Manitowoc	Lietzkes lake	4,500
		9,000
MARATHON COUNTY—		
N. Schmidt, Marathon	Scotch creek	5,000
Fred Prehn, Marathon	Scotch creek	5,000
Joe Wiffeler, Marathon	Wiffeler creek	5,000
A. Schneiders, Marathon	Scotch creek	5,000
A. Grelie, Marathon	South Branch of Embarrass river	7,000
Alex. Alfee, Norrie	South Branch of Embarrass river	7,000
Geo. W. Taves, Edgar	Hamans creek	7,000
Aug. Hanneman, Edgar	Hanneman creek	7,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
MARATHON COUNTY—Continued.		
Daniel A. Seely, Galloway	West Fork of North Branch of Little Wolf river	3,000
C. E. Guenther, Knowlton	Little Eau Claire river and Little Sandy river	6,000
Geo. Belanger, Wausau	Trappe river	6,000
John Wintzki, Wausau	Trappe river	4,500
E. J. Lauterhahn, Wausau	Trib. of Trappe river	6,000
Albert Blake, Mosinee	Bull Junior creek	1,500
A. E. Donville, Mosinee	Bull Junior creek	1,500
Arden Paronto, Mosinee	Four-mile creek	3,000
Frank Paronto, Mosinee	Four-mile creek	1,500
Frank Brabant, Mosinee	Hawk creek	1,500
Henry Kreutzer, Athens	Black creek	3,000
A. N. Whiting, Marathon	Scotch creek	2,000
John Simsen, Marathon	Scotch creek	2,000
H. A. Fricke, Marathon	Rib river	2,000
Theo. Lapack, Marathon	Loyes creek	2,000
R. O. Busse, Marathon	Berger creek	2,000
		95,500
MARINETTE COUNTY—		
Hugh Bahlert, Pound	Murphy creek	3,000
A. T. Fairchild, Marinette	Main Pike creek	6,000
Joe Fortnum, Amberg	Robinsons brook	3,000
Frank R. Kniskern, Middle Inlet	Lower inlet	6,000
E. J. Baker, Marinette	Small Branches Pike river	7,500
John Striffler, Marinette	Peshtigo river	6,000
W. E. Hollenbeck, Wausaukee	Trib. of Peshtigo river	7,500
L. Lundgren, Pembine	Pembine creek	12,000
		51,000
MARQUETTE COUNTY—		
J. M. Donahue, Montello	Bell Fountain creek	3,000
Wm. Guderiahn, Montello	Montello river	3,000
August Muske, Westfield	Chaffee and Weddie creeks	3,000
Geo. Fenner, Oxford	Middle Neenah creek	3,000
W. J. Ogle, Oxford	Osborn creek	3,000
W. F. Ogle, Oxford	Upper Neenah creek	3,000
Andrew Schobie, Neshkoro	White river below dam at Neshkoro	3,000
		21,000
MONROE COUNTY—		
Wm. Roder, Sr., Tomah	Bear creek	3,000
W. H. Root, Tomah	Bear creek	3,000
Geo. P. Stevens, Tomah	Little Silver creek	3,000
Fred Ziegler, Tomah	Council creek	3,000
Eustace Beck, Warrens	Rudd creek	3,000
Carroll A. Jay, Warrens	Sand creek	3,000
L. M. Earle, Cashton	Brush creek	6,000
Chas. M. Waffle, Kendall	Lysdam creek	3,000
T. M. Mills, Wilton	Posy creek	3,000
Charles Todd, Wilton	West Branch of Slaten creek	3,000
John E. Gruber, Wilton	Kickapoo river	3,000
Chas. Weingarten, Wilton	Hubbard stream	1,500
E. H. Dreier, Norwalk	Nrunner creek	1,500
E. McGary, Norwalk	Morris creek	1,500
John Weibl, Norwalk	Walz stream	1,500
J. P. Andres, Norwalk	Branch of Morris creek	1,500
Peter Christ, Norwalk	Head of Moose creek	3,000
John G. Schell, Norwalk	Trib. of Moose creek	1,500
S. Sloggy, Ontario	Cook, Brush and Brey creeks	4,500

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
MONROE COUNTY—Continued.		
Jenks Williams, Sparta	South Silver creek	3,000
Wm. J. McCance, Sparta	East Beaver creek	3,000
B. W. Cooley, Sparta	Tar creek	3,000
H. W. Barker, Sparta	Streams in locality of Sparta.	6,000
		67,000
OCONTO COUNTY—		
James Cerveny, Oconto Falls	Inlet of Porcupine lake	3,000
H. H. Caldwell, Oconto Falls	Daily creek	3,000
A. Baker, Lakewood	North Branch of Oconto river	10,500
A. W. Rugg, Lakewood	North Branch of Oconto river	3,000
Rupert J. Henry, Lakewood	South Branch of Oconto river	3,000
		22,500
ONEIDA COUNTY—		
Charles Johnson, Harshaw	Rice creek	3,000
Andrew Oleson, Harshaw	Bear-skin creek	3,000
D. M. Scott, Tripole	Little Snow creek	4,000
W. A. Lucia, Woodruff	Breomer creek	4,000
Henry Coon, Woodruff	Allequash creek	4,000
C. J. Coon, Woodruff	Spring creek	4,000
		22,000
PEPIN COUNTY—		
A. C. Huleatt, Arkansaw	Arkansaw creek	4,500
James Preston, Durand	Bear creek	4,500
A. Thies, Pepin	Big Plum creek	6,000
		15,000
PIERCE COUNTY—		
Rod S. Williams, River Falls	Kinnickinnic river	7,500
G. W. Cornelison, Elsworth	Trimbelle creek	1,500
George Gordon, Ellsworth	Trimbelle creek	1,500
C. L. Muggah, Ellsworth	Brush creek	1,500
Carl Fresee, Ellsworth	Rush river	1,500
J. A. Fresse, Ellsworth	Loose river	1,500
W. W. Walsingham, Ellsworth	Rush river	1,500
Mathias Zimhelt, Ellsworth	Spring creek	1,500
True Meachan, Ellsworth	Spring brook	1,500
D. L. Maynard, Ellsworth	Cave creek	1,500
W. R. Vanasse, Spring Valley	French creek	3,000
Frank Craine, Spring Valley	French and Burghardt creeks	3,000
Claude Craine, Spring Valley	Cady and Gilbert creeks	3,000
Frank A. Springer, Elmwood	Cady creek	4,500
Chas. H. Staff, Prescott	Kinnickinnic river	3,000
A. F. Herold, Maiden Rock	Carson creek and Rush river.	6,000
Adolph Olson, Maiden Rock	East Branch of Plum creek..	3,000
Geo. Gilles, Jr., Plum City	Tailors pond	3,000
H. V. T. Suter, Plum City	Main branch of Plum creek ..	3,000
C. E. Fox, Elmwood	Eau Galle river	1,500
Frank A. Springer, Elmwood	Cady creek	1,500
Elmer McKennon, Elmwood	Cady creek	1,500
Willie Olson, Elmwood	Eau Galle river	1,500
		58,500
POLK COUNTY—		
W. T. Kennedy, Amery	Beaver brook	2,000
H. H. Hart, Amery	South Fork of Bull river	2,000
S. L. Pennington, Amery	Beaver brook	4,000
J. A. Young, Amery	Balsam brook	4,000
Peter Peterson, Amery	Beaver creek	3,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
POLK COUNTY—Continued.		
John Howe, Amery	Spring brook	4,000
F. A. Brandt, Nye	Horse creek	4,000
L. P. Melfostad, Deronda	Branch of Sucker river	4,000
Geo. S. Sylvester, Deronda	Sucker branch	2,000
John Weckerling, Deronda	Sucker branch	2,000
I. N. Nye, Deronda	Sucker branch	2,000
D. P. Butts, Frederic	South Fork of Trade river	4,000
L. A. Copeland, Frederic	South Branch of Trade river	4,000
A. J. Marcoe, Frederic	Wood river	4,000
John Keidel, Frederic	Wood river	2,000
C. O. Johnson, Frederic	Wood river	2,000
J. D. Rice, Frederic	Wood river	2,000
C. A. Carlson, Frederic	Wood river	2,000
		52,000
PORTAGE COUNTY—		
O. F. Meyer, Rosholt	South Branch of Little Wolf river	3,000
M. H. Marken, Rosholt	South Branch of Little Wolf river	1,500
Tom Windorf, Rosholt	South Branch of Little Wolf river	1,500
M. B. Wolding, Rosholt	Albany river	3,000
Benj. Fleming, Amherst	Waupaca river	6,000
M. A. Fleming, Amherst	Waupaca river	6,000
Wm. A. Peterson, Amherst	To-morrow river and Een's creek	3,000
J. S. Loberg, Nelsonville	Waupaca river	6,000
E. Viertel, Stevens Point	Big Plover river	3,000
Frank Abb, Stevens Point	Four-mile creek	1,500
Ptrick O'Connor, Stevens Point	Rocky run	3,000
A. B. Clements, Stevens Point	Little Plover river	1,500
Wm. Jauch, Stevens Point	Little Plover river	1,500
Frank Peickart, Stevens Point	North Branch of Little Wolf river	3,000
Ernest Maddy, Stevens Point	Rocky run	3,000
D. J. Kelsey, Stevens Point	Big Plover run	1,500
A. C. Krembs, Stevens Point	Little Plover river	1,500
L. P. Moen, Stevens Point	Little Plover river	1,500
		51,000
PRICE COUNTY—		
M. A. Dratt, Park Falls	Hamilton creek	4,000
Den. Holy, Park Falls	Smith creek	4,000
Patterson Bros., Fifield	Davis creek	4,000
E. J. Marsh, Fifield	Sailor creek	4,000
J. E. Feely, Fifield	Springstead creek	8,000
Geo. F. Siewell, Phillips	Mount Pele creek	8,000
W. H. Douglas, Prentice	Molden creek	4,000
H. R. Blomberg, Prentice	Hay creek	4,000
Henry Helm, Ogema	Spirit creek	4,000
F. W. Borst, Spirit	North Branch of Spirit river	2,000
N. S. Smith, Ogema	Otter-tail and Holmes creeks	4,000
Geo. Reichert, Kennan	Skinner creek	4,000
		54,000
RICHLAND COUNTY—		
H. W. Haskell, Lone Rock	Little Bear creek	3,000
Alex. Ray, Lone Rock	Pennsylvania creek	1,500
C. S. Fuller, Lone Rock	Marbel Quarry creek	1,500
Nels Christenson, Lone Rock	Mary creek	1,500

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
RICHLAND COUNTY—Continued.		
T. K. Fries, Lone Rock	McCarvil creek	1,500
A. J. Dickerson, Lone Rock	Jackson creek	1,500
J. G. Anderson, Cazenovia	Cazenovia pond	3,000
J. S. Herlily, Cazenovia	Cazenovia pond	3,000
Jas. Nolan, Sextonville	Marble Quarry creek	3,000
N. C. Waddell, Sextonville	Little Willow creek	3,000
F. W. Dudley, Sextonville	South-hollow creek	3,000
Wm. Householder, Richland Center..	Horse creek	3,000
Richard Burwertz, Richland Center...	Head of Ash creek	3,000
Elige Mayfield, Richland Center	Trib. to Ash creek	3,000
		34,500
RUSK COUNTY—		
John Anderson, Weyerhauser	Hay creek	4,000
Thos. S. Thompson, Ladysmith	Cedar and Willow creeks	2,000
P. S. Kieth, Ladysmith	Moose-ear creek	2,000
S. D. Switzer, Ladysmith	Moose-ear creek	2,000
R. S. Johnson, Ladysmith	Hay creek	4,000
E. W. Hill, Ladysmith	Weighor creek	2,000
F. E. Munroe, Ladysmith	Weighor creek	2,000
W. L. Stephenson, Ladysmith	Little Thorn-apple creek	2,000
W. C. Dale, Weyerhauser	Little Soft-maple creek	4,000
J. A. Severson, Weyerhauser	Big Soft-maple creek	2,000
D. E. Getchel, Weyerhauser	Big Soft-maple creek	2,000
L. J. Erickson, Weyerhauser	Spring creek	2,000
A. H. Skosgtad, Weyerhauser	Big Soft-maple creek	2,000
H. W. True, Glen Flora	Main creek	4,000
Jim Bucholz, Glen Flora	Hickey creek	4,000
D. H. Hayen, Ingram	South Branch of Main creek.	4,000
J. H. Hogston, Ingram	Little Jump river	4,000
J. H. Bowker, Strickland	Moose-ear creek	4,000
J. A. Severson, Weyerhauser	Moose-ear creek	4,000
W. H. Bowker, Strickland	Cadman creek	2,000
Otto Alvin, Strickland	Cadman creek	2,000
H. L. Clark, Ladysmith	Cedar creek	4,000
		64,000
ST. CROIX COUNTY—		
S. L. Pickett, Wilson	Tucker and Cohen creeks	3,000
Wm. Ryan, Wilson	Knowles and Hay creeks	3,000
R. R. Foss, Woodville	Northwest Branch of Eau Galle river	3,000
B. G. Stockman, Woodville	North Branch of Eau Galle river	3,000
J. C. Harding, Hudson	Underwood spring	3,000
J. E. Jones, Hudson	Willow river	3,000
L. G. Greene, Hudson	Willow river	3,000
M. M. Fulton, Hudson	Willow river	3,000
Albert Anderson, Hudson	Willow river	3,000
Herman Grunke, Cylon	Hatton creek	3,000
John Pearson, Somerset	Apple river	3,000
Joseph Yoerg, Hudson	Willow river	3,000
M. Goldberg, Hudson	Willow river	3,000
Frank Beer, Burkhardt	Willow river	4,000
Jos. Smith, Burkhardt	Willow river	4,000
Chas. McKenzie, Burkhardt	Willow river	4,000
Chas. Jones, Deer Park	Upper Willow river	4,000
		55,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
SAUK COUNTY—		
B. D. Sherwood, Spring Green	Honey creek	3,000
Geo. E. Talbot, Lime Ridge	Narrows creek	3,000
		6,000
SAWYER COUNTY—		
Geo. W. Charters, Jr., Couderay	Wind-fall creek	4,000
Geo. Charters, Jr., Couderay	Wind-fall creek	4,000
Paul A. Vollbrecht, Couderay	Wind-fall creek	2,000
R. W. Reiser, Couderay	Wind-fall creek	2,000
W. H. B. Campbell, Radisson	Wiergore creek	4,000
L. N. Bates, Radisson	Couderay river	8,000
Joe. Garbutt, Birchwood	Knudson creek	4,000
C. D. Benack, Hayward	Trib. to Round lake	4,000
W. H. Ellis, Hayward	Trib. to Round lake	4,000
H. Hanson, Hayward	Hanson stream	4,000
Frank L. McNamara, Hayward	Namakagon river	4,000
D. B. Whittman, Hayward	Namakagon river	4,000
Robt. C. Pugh, Hayward	Mosquito creek	4,000
Wm. Penquite, Hayward	Ayres creek	4,000
Geo. E. Buckley, Hayward	Namakagon river	4,000
Ira C. Phillips, Hayward	Namakagon river	4,000
		64,000
SHAWANO COUNTY—		
Albert Fathen, Shawano	West Branch of Wolf river	4,500
M. J. Wallrich, Shawano	Red river	4,500
J. Lehmann & Son, Tigerton	Tigerton creek	3,000
John Hoffman, Tigerton	Tiger creek and Embarrass river	3,000
John Foss, Tigerton	Deligase creek	3,000
Robt. Petko, Tigerton	Comet creek	1,500
August Schwede, Tigerton	Stinke creek	1,500
Chas. H. Edler, Whitcomb	Tiger creek	3,000
I. L. Rice, Wittenberg	Embarrass river	1,500
R. B. Glaubitz, Wittenberg	Middle Branch of Embarrass river	1,500
Frank Kuschel, Wittenberg	North Branch of Embarrass river	1,500
Frank Hitzke, Wittenberg	South Branch of Embarrass river	1,500
Herman Wiskow, Wittenberg	Middle Branch of Embarrass river	1,500
Wm. Happe, Wittenberg	Middle Branch of Embarrass river	1,500
Herman F. Jahnke, Regina	North Branch of Embarrass river	3,000
Elvin Franklin, Jr., Eland Jct.	South Branch of Embarrass river	3,000
Wm. Shenck, Shepley	Wilson and Sprague creeks	4,500
Arthur Cady, Birnamwood	Middle Branch of Embarrass and Plover rivers	6,000
E. E. Hemmingway, Mattoon	West Branch of Red river	8,000
Wm. Schenke, Shepley	Wilson creek	6,000
		63,500

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
SHEBOYGAN COUNTY—		
Chas. G. Peck, Sheboygan Falls	South Branch of Onion river.	3,000
B. H. Sanford, Sheboygan Falls	Briggs creek	3,000
Henry C. Gruebner, Sheboygan	North Branch of Milwaukee river	3,000
H. C. Gruebner, Sheboygan	Mullet river	3,000
		12,000
TAYLOR COUNTY—		
J. W. Kaye, Westboro	Silver creek	4,000
F. M. Perry, Westboro	Chelsa Lake creek	4,000
C. J. C. Brearly, Westboro	Wahl creek	4,000
T. G. Jeffers, Medford	Trappers creek	8,000
Oscar Nystrum, Medford	Rib river	8,000
Theo. Engstrand, Rib Lake	Little Rib river	4,000
Geo. E. Hagen, Rib Lake	Waad river	6,000
L. L. Taylor, Rib Lake	Rib Lake	4,000
		42,000
TREMPEALEAU COUNTY—		
G. O. Lindeman, Osseo	South Fork	3,000
Bert L. Hume, Osseo	Otter creek	3,000
Geo. W. Raas, Osseo	North Beef river	3,000
H. F. Clausen, Galesville	Skundberg, French and Abrahamson-coulee creeks	6,000
		15,000
VERNON COUNTY—		
J. J. Marshall, La Farge	Otter and Bear creeks	6,000
G. W. Shattuck, La Farge	Jug creek	4,500
R. A. Armbruster, Hillsboro	West Branch Baraboo river..	3,000
C. F. Kaufman, Hillsboro	Holfeldt creek	3,000
Gus. Kolb, Hillsboro	Williams creek	3,000
Alfred Chute, Hillsboro	Warner creek	3,000
A. F. Love, Viroqua	West Kickapoo river	6,000
Albert Ageness, Viroqua	North Branch Bad Axe river.	1,500
Norton Anderson, Westby	Seas branch	1,500
S. B. Reque, Westby	East Branch of Coon creek ..	[illegible]
C. T. Shannon, Westby	Spring creek	1,500
James Lee, Westby	West Branch Kickapoo river.	1,500
J. K. Schreiner, Westby	Head of Coon creek	1,500
A. H. Dahl, Westby	Sloan creek	1,500
J. C. Baglien, Westby	Sloan creek	1,500
H. A. Nerison, Westby	Springdale creek	1,500
Chas. M. Ballsrud, Westby	Clock-maker creek	1,500
Sveen Borgard, Coon Valley	Spring-coulee creek	3,000
A. Nelson, Coon Valley	Johnson creek	1,500
C. N. Reprude, Coon Valley	Coon creek	3,000
Henry A. Nelson, Coon Valley	Sather creek	1,500
		52,500
VILAS COUNTY—		
Peter J. Reis, Arbor Vitae	Cedar creek	3,000
H. W. Seefeld, Arbor Vitae	North Inlet to Big Arbor Vitae lake	3,000
J. H. Martin, Arbor Vitae	Martin creek	3,000
S. B. Bissell, Arbor Vitae	Martin creek	3,000
Tom Olson, Star Lake	Lone Lue lake	6,000
J. W. Lant, Star Lake	Lost creek	6,000
Edw. Lacon, Eagle River	Deer-skin creek	4,000
W. J. Pinkerton, Eagle River	Trib. of Wisconsin river	4,000
F. Beardsley, Eagle River	Deer-skin river	4,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
VILAS COUNTY—Continued.		
Geo. Muchler, Eagle River	Crystal lake	4,000
Jas. Bruns, Eagle River	Deer-skin river	4,000
A. A. Babcock, Appleton	Kentuck lake	4,000
James P. Hobart, Hackley	Deer-skin river	4,000
Harry G. Frank, State Line	Wisconsin river	6,000
L. L. Thomas, Donaldson	Hay-meadow creek	6,000
Chas. E. Hazen, Hackley	Deer-skin creek	6,000
		70,000
WALWORTH COUNTY—		
J. A. Collin, Delavan	Spring brook	3,000
Edw. Tilden, Delavan	Out-let Delavan lake	3,000
C. B. Alrich, Whitewater	Bloodgood stream	3,000
R. M. Cox, Whitewater	Spring stream	3,000
Edwin McDougall, Whitewater	Trib. to Mill pond	3,000
Wm. Larkin, Whitewater	Larkin creek	3,000
		18,000
WASHBURN COUNTY—		
Albert Lampson, Minong	Stuntz brook	2,000
John L. Gilbert, Minong	Peanbue Valley creek	2,000
Ralph R. Jones, Minong	Big Frog creek	2,000
A. E. Adams, Minong	Chicago brook	2,000
J. J. Hohl, Minong	Big and Little Frog creeks	4,000
Ira B. Cartwright, Minong	Shell creek	2,000
Clarence E. Wise, Birchwood	Sucker creek	4,000
B. H. Kirch, Birchwood	Carter creek	4,000
F. H. Newby, Birchwood	Patterson creek	4,000
Barney Mullin, Shell Lake	Branch of Gold creek	4,000
I. G. Crowell, Shell Lake	Clam river	4,000
Wm. E. Klosete, Shell Lake	Beaver creek	2,000
W. B. Hanson, Shell Lake	Beaver creek	2,000
E. E. Stover, Shell Lake	Clam river	2,000
C. J. Stover, Shell Lake	Sawyer brook	2,000
A. J. Hanson, Shell Lake	Baskaw branch	4,000
John Smith, Trego	Gull and Spring creeks	4,000
James Chunock, Spooner	Potatoe creek	4,000
A. J. Jurgenson, Spooner	Spring creek	6,000
A. Peasler, Spooner	Little McKenzie brook	6,000
		66,000
WASHINGTON COUNTY—		
Geo. Hirschbeack, Barton	Wallerd lake	3,000
Andrew Lehner, Schleisingerville	In Rivulet inlets, Lenhers lake	3,000
F. L. County, Hartford	Oilspring creek	3,000
		9,000
WAUKESHA COUNTY—		
Philip H. Jones, Wales	Upper Schuppernong creek	3,000
C. W. Simonds, Hartland	Bark river	3,000
H. E. Salsich, Hartland	Lower Bark river	3,000
C. W. Peterson, Hartland	Lower Bark river	3,000
F. F. Machus, Oconomowoc	Battle creek	3,000
G. R. Rice, North Prairie	White creek	3,000
W. H. Tuohy, Eagle	Eagle Spring creek	3,000
H. Husten, Eagle	Husten lake	1,500
D. H. Bergh, Eagle	Bottomly creek	1,500
Frank Boland, Eagle	Bakers creek	1,500
James P. Donlan, Eagle	Jericho creek	1,500
		27,000

Distribution of Fish.

RAINBOW TROUT, ADVANCED FRY, PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
WAUPACA COUNTY—		
Geo. E. Lidon, Iola	South Branch of Little Wolf river	3,000
A. P. Swenson, Iola	Iola creek	3,000
B. S. Peterson, Iola	Trib. South Branch of Wolf river	3,000
C. H. Anderson, Scandinavia	Southwest Branch of Little Wolf river	3,000
Martin Tollefson, Scandinavia	South Branch of Little Wolf river	3,000
L. W. Krake, Waupaca	Crystal river	6,000
Edward E. Browne, Waupaca	Emmons creek and Waupaca river	12,000
Earl L. Durrant, Sheridan	Sherman stream	1,500
Will Morey, Sheridan	Waupaca river	1,500
A. B. Root, Sheridan	Waupaca river	1,500
P. C. Jensen, Sheridan	Waupaca river	1,500
B. Suber, Sheridan	Waupaca river	1,500
Ed. Ross, Sheridan	Sannes creek	3,000
J. G. Cornwell, Sheridan	Besson creek	3,000
Earl Durrant, Sheridan	Sherman stream	3,000
		49,500
WAUSHARA COUNTY—		
L. W. Beach, Hancock	Roche a Cri creek	3,000
R. B. Silverthorn, Hancock	Mecan river	1,500
M. O'Connor, Hancock	Mecan river	1,500
Ed. O'Connor, Hancock	Mecan river	3,000
G. N. Spaulding, Hancock	White river	1,500
Fred Meirhofer, Hancock	Little Roche a Cri creek	1,500
C. A. Patterson, Hancock	Mecan river	1,500
John N. Gregor, Poy Sippi	Silver creek	3,000
Chas. A. Benedict, Poy Sippi	Pine creek	3,000
F. M. Hawley, Poy Sippi	Silver creek	1,500
E. C. Brewster, Poy Sippi	Silver creek	1,500
E. F. Kileen, Wautoma	Mecan river	6,000
F. S. Dyrham, Wautoma	Bird creek	3,000
R. E. Ades, Wautoma	White river	3,000
A. J. Ryan, Neshkoro	Sucker creek	3,000
		37,500
WOOD COUNTY—		
Alex. M. Muir, Grand Rapids	Four-mile creek	3,000
James Walsh, Grand Rapids	Two-mile creek	3,000
Guy R. Wood, Grand Rapids	Two-mile creek	3,000
Henry C. Demit, Grand Rapids	Five-mile creek	3,000
Geo. W. Baker, Grand Rapids	Four-mile creek	3,000
Emil S. Kliner, Marshfield	Squaw creek	3,000
Chas. Varney, Greenwood	Gile creek	3,000
James Tompkins, Greenwood	Chadwick creek	1,500
		22,500
Total rainbow trout fry planted, 1908		2,098,500

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
ASHLAND COUNTY—		
Theo. R. Yankee, Ashland	Round lake	100,000
Herman Beuchner, Butternut	Butternut lake	100,000
Paul Zoesch, Butternut	Butternut lake	100,000
August Carlson, Butternut	Bass lake	100,000
Chas. Weber, Butternut	Bass lake	100,000
John Wood, Butternut	Lake in Sec. 14, T. 43, R. 7 W.	100,000
W. E. Dillon, Butternut	Butternut lake	200,000
C .A. Poundstone, Mellen	Duck and Spider lakes	100,000
Robert Johnson, Mellen	Lake Caroline	100,000
Frank Cramer, Mellen	English lake	100,000
S. D. Hodson, Mellen	Bad river	100,000
W. W. Beuch, Mellen	Long lake	100,000
C. G. Fabner, Mellen	Herbert lake	100,000
		1,400,000
BARRON COUNTY—		
A. L. Anderson, Cumberland	Bucks and Dummy lakes	150,000
L. E. Griswold, Turtle Lake	Hillman lake	150,000
J. H. Bunker, Turtle Lake	Lower Turtle lake	150,000
A. O. Blix, Turtle Lake	Horse-shoe lake	150,000
John W. Hogan, Turtle Lake	Horse-shoe lake	300,000
John Gaffney, Turtle Lake	Horse-shoe lake	150,000
Joseph Macah, Haugen	Devils lake	75,000
John G. Walter, Haugen	Devils lake	75,000
Louis Walter, Haugen	Devils lake	75,000
Simeon Schmid, Haugen	Devils lake	75,000
Alfred Johnson, Haugen	Devils lake	75,000
Frank Kozlih, Haugen	Devils lake	75,000
John Bergman, Haugen	Devils lake	75,000
Geo. Kunesch, Haugen	Devils lake	75,000
Frank Rezarch, Haugen	Devils lake	75,000
Robert F. Barlow, Haugen	Devils lake	75,000
F. C. Gifford, Haugen	Bear lake	375,000
Erique Paradis, Rice Lake	Rice lake	150,000
J. H. Wilz, Rice Lake	Rice lake	150,000
H. F. Borst, Rice Lake	Rice lake	150,000
Frank Goettscke, Rice Lake	Rice lake	150,000
Chas. Sail, Rice Lake	Rice lake	150,000
Simon Berg, Cameron	Dietz lake	150,000
M. B. Hubbard, Eau Claire	Prairie lake	150,000
A. D. Brewer, Altoona	Lake Pokegama	150,000
Lewis P. Charles, Chetek	Lake Chetek	150,000
T. J. Zeisinger, Chetek	Bass lake	150,000
W. J. Burnham, Chetek	Lake Chetek	150,000
F. B. Kinsley, Barron	Paskin lake	300,000
A. Rosenbush, Turtle lake	Horse-shoe lake	150,000
		4,275,000
BAYFIELD COUNTY—		
Geo. Francis, Washburn	Siskenet lake	150,000
Wm. C. Colburn, Grand View	Porcupine, Diamond and Crystal lakes	300,000
Harry Moore, Cable	Cable lake	150,000
W. E. Sharp, Cable	Ole lake	150,000
Frank W. Klemm, Cable	Lake Namekagon	150,000
Joe. La Pointe, Cable	Namekagon lake	150,000
W. A. Parent, Cable	Cable lake	150,000
James McNaught, Cable	Rock lake	150,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
BAYFIELD COUNTY—Continued.		
Gus. Headquist, Iron River	East Eight-mile lake	150,000
Henry Kitzrow, Iron River	Milwaukee lake	150,000
H. H. Jewett, Iron River	Pike lake	150,000
R. A. Kinloch, Iron River	Crooked lake	150,000
E. A. Ross, Iron River	Pike lake	150,000
H. C. Hall, Iron River	Pike lake	150,000
H. O. Lund, Iron River	Pike lake	150,000
		2,400,000
BROWN COUNTY—		
L .A. Clark, Little Rapids	Fox river	200,000
BUFFALO COUNTY—		
M. H. Amidon, Mondovi	Emerald lake and pond	100,000
J. W. Trowbridge, Mondovi	Mirror lake	100,000
		200,000
BURNETTE COUNTY—		
H. W. Bruner, Spooner	Lake in Sec. 24, T. 40, R. 14	150,000
CALUMET COUNTY—		
A. J. Pfeffer, Chilton	Manitowoc river	100,000
H. D. Lauson, New Holstein	Cedar and Wilke lakes	150,000
		250,000
CHIPPEWA COUNTY—		
C. S. Little, Stanley	Fish lake	100,000
Bloomer Rod and Gun Club, Bloomer	Cornell, Round and Long lakes	750,000
		850,000
CLARK COUNTY—		
F. M. Anderson, Greenwood	Black river	100,000
H. J. Peissing, Curtiss	North Fork of Poplar river	100,000
Gilbert Johnson, Neillsville	Cunningham river	100,000
L. G. Masters, Neillsville	Black river	100,000
Wm. Heaslett, Neillsville	Black river	50,000
Geo. K. Redmond, Neillsville	Black river	100,000
		550,000
COLUMBIA COUNTY—		
R. O. Spear, Pardeeville	Pardeeville lake	100,000
J. S. Heath, Pardeeville	Pardeeville lake	100,000
J. E. Horton, Pardeeville	Crystal lake	100,000
Frank H. Smith, Pardeeville	Pardeeville lake	100,000
Frank H. Smith, Pardeeville	Pardeeville pond	200,000
E. A. Gowran, Portage	Swan lake	200,000
		800,000
CRAWFORD COUNTY—		
G. H. Davidson, Soldiers Grove	Kickapoo river	250,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
DANE COUNTY—		
Arthur Sykes, Madison	Lakes Monona and Mendota.	1,000,000
W. S. Wood, Stoughton	Kegonsa lake	100,000
W. F. Gilman, Stoughton	Kegonsa lake	100,000
Henry Hoehn, Monroe	Kegonsa lake	100,000
H. W. Collins, Stoughton	Kegonsa lake	100,000
J. H. Weber, Stoughton	Kegonsa lake	100,000
A. M. Field, McFarland	Waubesa lake	250,000
H. G. Goodlad, Black Earth	Mann creek	100,000
G. C. Roemhild, Black Earth	Black Earth creek	100,000
Frank Spaulding, Windsor	Token creek Mill Pond	100,000
H. W. Cowles, Cambridge	Lake Ripley	150,000
O. Gustoveson, London	Lake Ripley	100,000
O. T. Olson, McFarland	Lake Waubesa	250,000
H. W. Collins, Stoughton	Kegonsa lake	500,000
G. H. Williamson, Madison	Lake Waubesa	500,000
Thomas and Harmon, Belleville	Sugar river	100,000
Henry Ross, Belleville	Sugar river	100,000
		3,750,000
DODGE COUNTY—		
Anton Welsch, Mayville	Kekoskee pond	200,000
H. Schwartzmueller, Mayville	Rock river above Mill Pond.	100,000
Eugene Ziegler, Mayville	Rock river above Mill Pond.	100,000
Geo. M. Bagley, Neosho	Neosho Mill Pond	100,000
O. W. A. Radloff, Hustisford	Hustisford lake	100,000
Murphy Bros., Fox Lake	Fox lake	400,000
Joe. Rowell, Beaver Dam	Beaver Dam lake	250,000
Murphy Bros., Fox Lake	Fox lake	500,000
Jas. Brown, Beaver Dam	Beaver Dam lake	350,000
		2,100,000
DOOR COUNTY—		
Samuel Perry, Forestville	Ahnapee river	100,000
George Schmitz, Forestville	Ahnapee river	100,000
		200,000
DOUGLAS COUNTY—		
Paul Fillinger, Wascott	Cranberry lake	150,000
Geo. F. Proctor, Wascott	Red lake	150,000
Thos. C. McLean, Superior	Red lake	150,000
A. C. Slate, Gordon	Red lake	150,000
Hattie F. Lowe, Gordon	Lake Favor	150,000
Nicholas Lucius Jr., Solon Springs	St. Croix lake	150,000
J. M. Sayles, Solon Springs	Twin lakes	150,000
Wm. Frick, Solon Springs	Twin lakes	150,000
Richard Bennett, Bennett	Lake Minnesuing	150,000
J. A. Lansworth, Brule	Petterson lake	150,000
Carl E. Carlson, Brule	Steels lake	150,000
W. J. Conness, Brule	Five-mile lake	150,000
H. F. Drake, Gordon	Lake Favor	150,000
		1,950,000
DUNN COUNTY—		
John J. Kaiser, Cadott	Yellow river	50,000
Geo. Boie, Cadott	Yellow river	50,000
Ben Dietrich, Cadott	Yellow river	50,000
Joe Dietrich, Cadott	Yellow river	50,000
Ed. B. Rosenberg, Cadott	Red Cedar river	50,000
G. F. Martin, Cadott	Red Cedar river	50,000
G. Hammer, Cadott	Red Cedar river	50,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
DUNN COUNTY—Continued.		
L. A. Larson, Cadott	Red Cedar river	50,000
H. C. Ivenfeldt, Menomonie	Lake Menomonie	100,000
F. W. Rowe, Menomonie	Lake Menomin	100,000
P. P. Graves, Menomonie	Pitt lake	100,000
E. P. Trautman, Menomonie	Red Cedar river	100,000
Wm. Schutte Jr., Menomonie	Hay river	100,000
		900,000
EAU CLAIRE COUNTY—		
I. Shoudy, Fairchild	Tribs. North Fork of Eau Claire river	200,000
Henry Wise, Fall Creek	Eau Claire river	200,000
Geo. Palmer, Altoona	Altoona lake	100,000
G. C. Miller, Altoona	Altoona lake	100,000
Jacob Baumberger, Eau Claire	Eau Claire river	100,000
Martin Baker, Eau Claire	Eau Claire river	100,000
Ole Hanson, Eau Claire	Eau Claire river	100,000
Carl F. Rinehard, Eau Claire	Half-moon lake	100,000
Iver Berg, Eau Claire	Eau Claire river	100,000
Guy J. Thompson, Eau Claire	Half-moon lake	1,100,000
		2,200,000
FLORENCE COUNTY—		
C. R. Hanson, Florence	Loon lake	100,000
Martin Runquist, Florence	Keyes lake	100,000
Mrs. C. R. Hanson, Florence	Loon lake	100,000
Max Sells, Florence	Keyes lake	100,000
J. E. Johnson, Long Lake	Long lake	100,000
M. R. Magaurn, Long Lake	Long lake	100,000
J. C. Alleside, Long Lake	Lake Halsey	100,000
Alva Gale, Long Lake	Fay lake	100,000
		800,000
FOND DU LAC COUNTY—		
W. W. Quick, Fond du Lac	Lake De Neveu	100,000
E. A. Galloway, Fond du Lac	Lake De Neveu	100,000
E. P. Worthing, Fond du Lac	Lake De Neveu	100,000
P. A. Hoffman, Campbellsport	Lake Fifteen	100,000
Herman J. Paas, Campbellsport	Mill pond	100,000
M. A. T. Hoffman, Campbellsport	Lake Fifteen	100,000
John Loebs, Campbellsport	Long lake	100,000
		700,000
FOREST COUNTY—		
Fred Morey, Wabeno	Trump lake	100,000
August Kohlhoff, Wabeno	Evergreen lake	100,000
Frank Kopecky, Wabeno	Long lake	100,000
Andrew Mueller, Wabeno	Leach lake	100,000
Jas. J. Martin, Laona	Silver lake	100,000
D. W. Connor, Laona	Birch lake	100,000
Connor Lbr. & Land Co., Laona	Birch lake	100,000
W. D. Connor, Laona	Birch lake	100,000
H. R. Messer, Laona	Riley lake	100,000
J. L. Schacher, Crandon	Rechard lake	150,000
E. L. Phillips, Milwaukee	Stone lake	150,000
F. J. Rhodes, Crandon	Rice lake	150,000
G. A. Lancaster, Crandon	Metonga lake	150,000
Fred J. Rogers, Nashville	Dry lake	150,000
John H. Dawley, Crandon	Rollingstone lake	150,000
		1,800,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
GRANT COUNTY—		
Fred L. Taylor, Blue River	James lake	100,000
GREEN LAKE COUNTY—		
H. P. Cody, Ripon	Green lake	250,000
Fred Soper, Ripon	Green lake	250,000
John Colder, Markesan	Lake Noria	150,000
H. Volkmann, Kingston	Spring lake	150,000
Norton Bros., Green Lake	Green lake	1,250,000
		2,050,000
IRON COUNTY—		
Calvin Doriot, Manitowish	Deer lake	150,000
Wm. Sherman, Manitowosh	Burns, French and Big Mus kellunge lake	750,000
Ed. Evenson, Mercer	Mercer lake	300,000
Carl Erickson, Mercer	Mercer lake	150,000
Geo. C. Foster, Hurley	Pine lake	300,000
M. J. Connors, Hurley	Moose lake	300,000
		1,950,000
JACKSON COUNTY—		
A. N. Larkin, Black River Falls	Black river	100,000
A. Fisher, Black River Falls	Black river	100,000
Ira Bowman, Black River Falls	Black river	100,000
F. W. Cole, Black River Falls	Black river	100,000
E. E. Moore, Merrillan	Pine lake	100,000
		500,000
JEFFERSON COUNTY—		
Jos. Stoppenbach, Jefferson	Rock river	200,000
W. H. Weld, Fort Atkinson	Rock river	150,000
Chas. E. Williams, Palmyra	Spring lake	50,000
Geo. Garbutt, Palmyra	Spring lake	50,000
Ben Harris, Palmyra	Spring lake	50,000
G. A. Buzzell, Palmyra	Spring lake	50,000
C. W. Bonnett, Palmyra	Spring lake	50,000
A. E. Cunningham, Hubbellton	Crawfish river	100,000
Edw. C. Shultz, Waterloo	Maunesha Mill pond	100,000
E. P. Mansfield, Lake Mills	Rock lake	500,000
		1,300,000
JUNEAU COUNTY—		
C. P. Babcock, Mauston	Lemonweir river	50,000
O. F. Headstream, Mauston	Lemonweir river	50,000
H. J. Hageman, Mauston	Lemonweir river	50,000
E. S. Wetherby, Mauston	Lemonweir river	50,000
J. Kimball, Mauston	Lemonweir river	50,000
C. E. Barthoff, Elroy	Baraboo river	100,000
C. J. Phillips, Camp Douglas	Big Lemonweir river	100,000
W. A. Kent Jr., Necedah	Yellow river	150,000
A. W. Christensen, Necedah	Necedah lake	150,000
J. E. Daly, Necedah	Yellow river	150,000
Jas. H. Spencer, Necedah	Yellow river	150,000
W. S. Hess, Necedah	Yellow river	150,000
		1,200,000

TROUT PONDS, WILD ROSE HATCHERY.

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
KENOSHA COUNTY—		
A. H. Bottleny, Bristol	Lake George	150,000
C. Shoeman, Powers Lake	Powers lake	100,000
H. J. Spetzman, Powers Lake	Powers lake	150,000
M. Loescher, Salem	Hooker lake	200,000
		600,000
LA FAYETTE COUNTY—		
Geo. Gould, Blanchardville	Pecatonica river	50,000
Carl Chandler, Blanchardville	Pecatonica river and Tribs.	50,000
W. E. Robinson, Blanchardville	Trib. Pecatonica river	50,000
C. Blanchard, Blanchardville	Pecatonica river	50,000
H. D. Thomas, Blanchardville	Pecatonica river	50,000
Victor Rossing, Argyle	West Pecatonica river	100,000
Chas. L. Piquett, Benton	Fever river	100,000
		450,000
LANGLADE COUNTY—		
C. L. Leykom, Antigo	Muellers lake	150,000
C. J. Morse, Antigo	Eau Claire river	150,000
Gust A. Kletzsch, Summit Lake	Summit lake	150,000
R. P. Guptill, Elcho	Enterprise lake	300,000
		750,000
LINCOLN COUNTY—		
H. E. Kluetz, Merrill	Wisconsin river	300,000
Thos. C. Olson, Merrill	Bass lake	150,000
Geo. A. Schroeder, Merrill	Bass lake	150,000
J. G. Poser, Merrill	Bass lake	150,000
Fred Heinemann, Heinemann	Echo lake	150,000
H. G. Hoover, Heinemann	Echo lake	150,000
John Pospisiel, Heinemann	Echo lake	150,000
C. M. Christiansen, Heinemann	Echo lake	150,000
Frank Nifler, Tomahawk	Smith lake	150,000
C. E. Macomber, Tomahawk	Clear lake	150,000
A. J. Olson, Tomahawk	Clear lake	150,000
David Mantz, Merrill	Lake View	300,000
W. G. Smith, Merrill	Tog lake	150,000
C. C. Ufer, Tomahawk	Wisconsin river	150,000
		2,400,000
MANITOWOC COUNTY—		
Otto Heidemann, Kiel	Cedar lake	100,000
Peter Wagner, Cleveland	Wagners pond	100,000
M. Staehle, Manitowoc	Manitowoc river above dam at Rapids	100,000
Fred Jackinstad, Manitowoc	West Twin river	100,000
John Wegner, Manitowoc	Glomsky lake	100,000
Chris. Guetschow, Manitowoc	Gass lake	50,000
Chas. Roedig, Manitowoc	Hasbaum lake	50,000
Henry Winkelman, Manitowoc	Silver lake	50,000
Chas. Kieschoost, Manitowoc	English lake	50,000
		700,000
MARATHON COUNTY—		
Alex. Lemmer, Marathon	Big Rib river	100,000
Louis Muelbeck, Marathon	Big Rib river	100,000
N. Schmidt, Marathon	Rib river	100,000
Joseph Horning, Marathon	Big Rib river	100,000
A. J. Torgerson, Galloway	Galloway lake	100,000
Ole J. Haealdron, Galloway	Forest lake	100,000
Otto C. Langfail, Wausau	Wisconsin river	150,000
J. W. Foster, Wausau	Wisconsin river	150,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
MARATHON COUNTY—Continued.		
John Hoffman, Wausau	Big Rib river	150,000
John Foster, Wausau	Big Rib river	150,000
Alex Fehl, Wausau	Wisconsin river	150,000
F. B. Fullmer, Schofield	Eau Claire river	150,000
John Fehl, Wausau	Little Rib river	150,000
		1,650,000
MARINETTE COUNTY—		
Hugh Baklert, Pound	Gill and Horse-shoe lakes	100,000
Geo. H. Hartwell, Crivitz	Lake Noquebay	150,000
James C Morgan, Wausaukee	Perch lake	150,000
John Lundgren, Pembine	Lundgren lake	100,000
		500,000
MARQUETTE COUNTY—		
Ray Johnson, Neshkoro	Neshkoro pond	100,000
F. L. Waldo, Westfield	Westfield mill pond	100,000
		200,000
MONROE COUNTY—		
H. W. Barker, Sparta	Lea river	250,000
OCONTO COUNTY—		
John J. Hof, Sobieski	Little Suamico river	100,000
Lewis P. Perry, Gillett	Berry lake	200,000
Robert A. Hintz, Underhill	Oconto river	100,000
Nels. Anderson, Mountain	Lake Isabel	150,000
Rupert J. Henry, Lakewood	Boot lake	100,000
Henry H. Hines, Lakewood	Chain of lakes	100,000
D. W. Fuller, Townsend	Fish lake	100,000
		850,000
ONEIDA COUNTY—		
L. K. Wright, Wausau	Two-Horse-head lakes	300,000
Emil Weisse, Elcho	Pelican lake	150,000
Geo. N. Weaver, Pelican Lake	Pelican lake	300,000
Yawkey Bissell Lbr. Co., Hazelhurst	Lake Catherine	600,000
T. B. McIndoe, Rhinelander	Pike lake	150,000
A. E. Weesner, Rhinelander	North Pelican lake	150,000
Thos. McDermott, Rhinelander	Crescent lake	150,000
Mr. Hole, Three Lakes	Three lakes	525,000
Rev. John McCoy, Eau Claire	Little Bass lake	150,000
Otto Roderald, Three Lakes	Round and Island lakes	150,000
L. A. Bishop, Three Lakes	Town Line lake	150,000
J. M. Korzilius, Three Lakes	Town Line lake	150,000
Andrew Hanson, Three Lakes	Spirit lake	150,000
John C. Small, Three Lakes	Smalls lake	150,000
James Nevin, Madison	Tomahawk lake	3,750,000
Robert Ripple, Woodruff	Tomahawk lake	1,875,000
F. Wesbee, Minocqua	Hill lake	450,000
Mr. Johnson, Minocqua	Mercer lake	750,000
Mrs. M. Barnum, Minocqua	Shishebogema lake	750,000
Henry Hanson, Woodruff	Squirrel lake	1,125,000
H. Backus, Woodruff	Lake Content	750,000
Robert Ripple, Woodruff	Minocqua lake	3,750,000
Robert Ripple, Woodruff	Carroll lake	1,875,000
		18,300,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
POLK COUNTY—		
Silvert Olson, Clear Lake	Ice lake	150,000
C. C. Ladd, Osceola	Bone lake	150,000
W. R. Laylor, Balsam Lake	Balsam lake	150,000
Geo. C. Teien, Balsam Lake	Balsam lake	150,000
J. W. Hack, Centuria	Half-moon lake	150,000
Thos. H. Brown, Centuria	Bass lake	150,000
Geo. Wild, Centuria	Long lake	150,000
A. L. Peterson, Centuria	Loveless lake	150,000
Jas. E. Schow, Luck	Big Butternut lake	150,000
Henry Van Hollan, Fredric	Kalmar lake	150,000
D. P. Butts, Fredric	Coon lake	150,000
F. H. Rasmussen, Dresser Junction	Big-horse lake	150,000
W. T. Kennedy, Amery	Apple river	150,000
H. H. Hart, Amery	Pike lake	150,000
S. L. Pennigton, Amery	Twin lake	150,000
Henry Anderson, Baldwin	Polk lake	150,000
J. A. Young, Amery	Apple river.	150,000
Peter Peterson, Amery	Sucker lake	150,000
W. D. Thompson, Amery	Twin lake	150,000
L. P. Melbostad, Deronda	Mud lake	150,000
Theo. Michelson, Deronda	Sucker lake	150,000
A. P. Jerdee, Deronda	Waupagasset lake	150,000
		3,300,000
PORTAGE COUNTY—		
Wm. A. Peterson, Amherst	To-morrow river	100,000
E. Viertel, Stevens Point	Wisconsin river	100,000
John McCorkindale, Stevens Point	Wisconsin river	100,000
Walter Eddy, Stevens Point	Wisconsin river	100,000
Frank Gano, Stevens Point	Little Plover river	100,000
C. A. Schenk, Stevens Point	Plover river	100,000
L. A. Humprey, Stevens Point	Little Plover river	100,000
F. M. Millbery, Stevens Point	Plover river	100,000
Lewis Gutko, Rosholt	Three lakes	100,000
W. L. Silmer, Rosholt	Kiolbassa lake	100,000
L. Peterson, Rosholt	Lake Helen	100,000
I. L. Rice, Rosholt	South Three lakes	100,000
		1,200,000
PRICE COUNTY—		
R. M. Horr, Prentice	Lake Worcester	100,000
Albert Habel, Phillips	Cranberry lake	200,000
F. L. Hunt, Phillips	Elk river	100,000
E. V. Covey, Phillips	Elk lake	100,000
W. P. Sperry, Phillips	Elk lake	100,000
N. E. Lane, Phillips	Elk river	100,000
M. A. Dratt, Park Falls	Snur lake	100,000
		700,000
RACINE COUNTY—		
Wm. Plucker, Waterford	Tichigan lake	200,000
John Buergermeister, Waterford	Fox river	100,000
B. Lavin & Sons, Kansasville	Eagle lake	200,000
Bernard Lavin, Kansasville	Eagle lake	250,000
		750,000
RICHLAND COUNTY—		
J. H. Frazier, Viola	White lake	100,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
ROCK COUNTY—		
L. E. Cunningham, Beloit	Rock river and Lake Koshkonong	500,000
D. W. North, Edgerton	Rock river	200,000
		700,000
RUSK COUNTY—		
Thos .J. Skrzypczak, Strickland	Bass lake	150,000
R. J. Caley, Bruce	Caley lake	150,000
W. L. Stephenson, Ladysmith	Big Thorn Apple and Flambeau lakes	150,000
C. K. Ellingston, Hawkins	Pike lake	150,000
		600,000
ST. CROIX COUNTY—		
John Pearson, Somerset	Pine lake	100,000
Howard Greenfield, New Richmond	McHenrys lake	100,000
Robert Douglas, Roberts	Silver lake	100,000
S. C. Broadman, New Richmond	Willow river	150,000
Eric Anderson, New Richmond	Cedar lake	150,000
Frank Beer, Burkhardt	Bass lake	150,000
Jos. Smith, Burkhardt	Bass lake	150,000
James Bush, Burkhardt	Skunk lake	150,000
Chas. McKenzie, Burkhardt	Bass lake	150,000
John Hennessey, New Richmond	Twin lakes	150,000
Ole B. Solum, Deer Park	Island lake	150,000
		1,500,000
SAUK COUNTY—		
B. D. Sherwood, Spring Green	Wisconsin river	100,000
F. B. Simpson, Spring Green	Wisconsin river	100,000
S. J. Hood, Baraboo	Devils lake	100,000
Chas. Dyke, Baraboo	Devils lake	100,000
Geo. Steckenbauer, Baraboo	Devils lake	100,000
Herman Grotophorst, Baraboo	Devils lake	100,000
John O'Neil, North Freedom	Mill pond	100,000
W. O. Hackett, North Freedom	Mirror lake	150,000
E. J. Lawton, North Freedom	Mirror lake	50,000
J. H. Miller, Reedsburg	Baraboo river	100,000
		1,000,000
SAWYER COUNTY—		
John Johnson, Hayward	Bass lake	150,000
W. J. Sabin, Hayward	Bug lake	150,000
W. E. Cornick, Hayward	Lost Land lake	150,000
M. J. Caldwell, Meteor	Deer lake	150,000
John H. Wohlford, Meteor	Deer lake	150,000
W. H. B. Campbell, Beauchene	Windfall lake	150,000
		900,000
SHAWANO COUNTY—		
W. J. Fagan, Cecil	Lake Shawano	200,000
G. W. Jones, Appleton	Clover Leak lakes	200,000
A. H. Mierswa, Shawano	Shawano lake	500,000
F. W. Gueller, Birnamwood	Mayflower lake	150,000
Herman Smith, Birnamwood	Lake in town of Norrie, Marathon county	150,000
		1,200,000
SHEBOYGAN COUNTY—		
Aug. Goetsch, Franklin	Sheboygan river	100,000
Chas. G. Peck, Sheboygan Falls	Sheboygan river	100,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
SHEBOYGAN COUNTY—Continued.		
Henry Gruebner, Sheboygan	Onion river	150,000
John T. Hoff, Random Lake	Random lake	250,000
August Weyland, Sheboygan	Crystal lake	100,000
A. Dennerlain, Plymouth	Crystal lake	50,000
		750,000
TAYLOR COUNTY—		
Herman Richter, Perkinstown	Richters lake	100,000
Oscar Nystrum, Medford	Ricket lake	100,000
E. W. Watson, Medford	Lake Easadore	100,000
R. W. Hugoboom, Medford	Clear lake	100,000
J. M. Hackett, Medford	Hull lake	100,000
Louis Supinsky, Medford	Sacket lake	100,000
A. F. Schmidt, Dorchester	Sheako lake	100,000
George F. Brann, Rib Lake	Huppers lake	100,000
A. J. Allard, Rib Lake	Mud lake	100,000
Anton Kauer, Rib Lake	North Everson lake	100,000
J. W. Kaye, Westboro	Harper lakes	100,000
		1,100,000
TREMPEALEAU COUNTY—		
A. B. Olson, Osseo	Linderman pond	50,000
Carl Olson, Osseo	Linderman pond	50,000
Fred Johnson, Osseo	Linderman pond	50,000
A. H. Brandon, Osseo	Linderman pond	50,000
		200,000
VERNON COUNTY—		
G. W. Henika, Readstown	Kickapoo river	200,000
C. H. Carter, Readstown	Kickapoo river	100,000
Robt. Hammer, Hillsboro	South Fork of Baraboo river.	100,000
		400,000
VILAS COUNTY—		
J. W. Lant, Star Lake	Pickerel lake	150,000
Chas. Aronson, Star Lake	Ballard lake	150,000
B. Finan, Star Lake	Lake Laura	150,000
Tom. Olson, Star Lake	Ballard lake	150,000
H. E. Salsich, Star Lake	Johnsons lake	75,000
G. R. Manthey, Star Lake	Johnsons lake	75,000
Henry Friend, Sayner	Found lake	150,000
Michael Froelich, Sayner	Plum lake	150,000
Fred Meloy, Sayner	Razorback lake	150,000
Herman Fabian, Sayner	Plum lake	150,000
A. J. Smith, Sayner	Plum lake	150,000
C. R. Smith, Sayner	Razorback lake	150,000
A. L. Kreutzer, Wausau	Plum lake	150,000
H. Warner, Plum Lake	Plum lake	150,000
Mr. McGregor, Sayner	Plum lake	300,000
O. W. Sayner, Sayner	Plum lake	225,000
Roy O. Buck, Spider Lake	Rest, Manitowish and Spider lakes	600,000
Earl Stevens, Eagle River	Cranberry lake	150,000
Jas. Burns, Eagle River	Eagle waters	150,000
F. F. Adams, Eagle River	Adams lake	150,000
S. H. Green, Eagle River	Lake St. Germain	150,000
W. J. Pinkerton, Eagle River	Catfish lake	150,000
Victor H. Stevens, Eagle River	Nelson lake	150,000
F. Beardsley, Eagle River	Inland lake	75,000
J. H. Wakefield, Eagle River	Little St. Germain lake	75,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
VILAS COUNTY—Continued.		
E. A. Everett, Eagle River	Eagle waters	375,000
G. H. Jackson, Eagle River	Little St. Germain lake	150,000
Geo. E. O'Connor, Eagle River	Lower lakes of Eagle Chain	150,000
R. D. Hannon, Eagle River	Eagle Chain of lakes	150,000
August Weil, Eagle River	Eagle Chain of lakes	150,000
T. I. Laughlin, Eagle River	Eagle Chain of lakes	150,000
Frank A. Hall, Eagle River	Eagle Chain of lakes	150,000
Noel St. Louis, Hackley	North Long lake	150,000
Chas. E. Hazen, Hackley	North Long lake	75,000
Hackley Phelps Bonnell Co., Hawley	Twin and Long lakes	75,000
A. J. St. Louis, Hackley	North Long lake	75,000
Eli. Thoris, Hackley	Long lake	75,000
I. Jansen, Hackley	Long lake	75,000
Harry Hoeke, Hackley	Long lake	75,000
Olga Adams, Hackley	Twin lake	75,000
Louis L. Thomas, Donaldson	Lac View Desert	150,000
Henry Nanny, State Line	Little Portage lake	150,000
Gust Anderson, Woodruff	Little Muskellunge lake	600,000
H. Weaver, Woodruff	Brandy lake	600,000
E. Wallace, Woodruff	Brandy lake	600,000
Jack Hills, Woodruff	Crooked lake	600,000
D. Paquette & Son	Bass lake	450,000
A. Greenier, Woodruff	Little Bass lake	300,000
C. H. Kamke, Woodruff	Big Arbor Vitae lake	150,000
Chas. Roy, Arbor Vitae	Big Arbor Vitae lake	150,000
Encad Roy, Arbor Vitae	Arbor Vitae lake	150,000
Emil Conrineau, Arbor Vitae	Arbor Vitae lake	150,000
Peter J. Reis, Arbor Vitae	Arbor Vitae lake	150,000
Julius Strauch, Arbor Vitae	Arbor Vitae lake	150,000
Albert Hoffman, Arbor Vitae	Arbor Vitae lake	150,000
H. A. Seefeld, Arbor Vitae	Arbor Vitae lake	150,000
John Eschenbauch, Arbor Vitae	Arbor Vitae lake	150,000
Fred H. Byington, Arbor Vitae	Arbor Vitae lake	150,000
		11,025,000
WALWORTH COUNTY—		
W. E. Sharp, Elkhorn	Lauderdale lakes	250,000
J. A. Collin, Delavan	Delavan lake	150,000
Edward Tilden, Delavan	Delavan lake	100,000
Chas. R. Sage, Delavan	Delavan lake	200,000
Walter Conaty, Whitewater	Mill pond	50,000
A. M. Hanson, Whitewater	Whitewater lake	150,000
Carl S. Douglas, Walworth	Geneva lake	500,000
W. A. Sharp, Elkhorn	Lauderdale lakes	500,000
Sage & Co., Delavan	Delavan lake	500,000
C. S. Douglas, Walworth	Geneva lake	500,000
		2,900,000
WASHBURN COUNTY—		
Wm. Huffer, Trego	Lake Sixteen	150,000
M. H. Gregg, Lampson	Hayleyon lake	150,000
F. L. Lampson, Lampson	Silver and High lakes	150,000
Albert E. Lampson, Minong	Horse-shoe lake	150,000
John N. Gilbert, Minong	Bond lake	150,000
Ralph R. Jones, Minong	Red lake	150,000
J. J. Hohl, Minong	Gilmore lake	150,000
W. B. Hanson, Shell Lake	Shell lake	150,000
I. G. Crowell, Shell Lake	Shell lake	150,000
L. D. Garyhart, Shell Lake	Long lake	150,000
John Smith, Trego	Gull lake	150,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
WASHBURN COUNTY—Continued.		
D. Bruner, Spooner	Deep lake	150,000
Bruce Fleming, Spooner	Yellow river	150,000
Fred Bruner, Spooner	Deep lake	150,000
C. L. Platz, Spooner	Loon lake	150,000
J. R. Bruner, Spooner	Temple lake	150,000
Frank Swoboda, Sarona	Ripley lake	150,000
W. F. Loomis, Birchwood	Lake Chetac	150,000
Louis Jensen, Birchwood	Birch lake	150,000
R. Mams, Birchwood	Birch lake	150,000
G. F. Andrew, Birchwood	Birch lake	150,000
John Mikinlor, Birchwood	Birch lake	150,000
W. H. Noves, Birchwood	Chetac lakes	150,000
Wm. S. Kyle, Birchwood	Chetac lake	150,000
F. H. Newby, Birchwood	Balsam lake	150,000
Bert Kirch, Birchwood	Balsam lake	150,000
E. A. Klatt, Birchwood	Birchwood lake	150,000
J. M. Gates, Birchwood	Big Chetac lake	150,000
		4,200,000
WASHINGTON COUNTY—		
Jos. A. Kircher, Barton	Wallers lake	100,000
Pottawatomie Club, No. Milwaukee	Pike lake	200,000
John Rosenheimer, Schleisingerville	Big Cedar lake	700,000
		1,000,000
WAUKESHA COUNTY—		
Samuel Kingston, Waukesha	Muskego lake	350,000
Mr. Meyer, Oconomowoc	Ashhippun, Fowler and La Belle lakes	2,000,000
Wm. Bell, Oconomowoc	Aulsebrook lake	200,000
B. P. Longley, Dousman	School Section lake	250,000
John Petersen, Delafield		300,000
C. W. Simonds, Hartland	Bark river and Bean lake	500,000
Louis Heimeral, Delafield	Nagawicka lake	500,000
A. E. Lacy, Okauchee	Okauchee lake	1,000,000
Wm. Kunz, Delafield	Pine lake	500,000
Albert Gallagher, Delafield	Nashotah lake	500,000
Albert Gallagher, Delafield	Nagawicka lake	750,000
Albert Gallagher, Delafield	Upper Nemahbin lake	1,000,000
Chas. Lichier, Delafield	Nagawicka lake	750,000
Ben Rogers, Okauchee	Okauchee lake	500,000
		9,100,000
WAUPACA COUNTY—		
L. W. Krake, Waupaca	Crystal river	100,000
C. Carrington, Pullman, Ill.	Columbean lake	100,000
LeRoy Larson, Iola	Rollafson lake	100,000
Adolph Lystul, Iola	Bestul lake	100,000
Martin J. Mork, Iola	Gram lake	100,000
O. T. Thompson, Iola	Helveta lake	100,000
Edw. E. Browne, Waupaca	Chain of lakes	750,000
Guy P. Werner, Clintonville	Pigeon river	150,000
Herman Marquardt, Caroline	Middle Embarrass river	150,000
		1,650,000
WAUSHARA COUNTY—		
G. A. Durkee, Spring Lake	Spring lake	100,000
Tom Durkee, Spring Lake	Spring lake	100,000
M. Moriaty, Neshkoro	Spring lake	100,000
A. J. Stevens, Wild Rose	Silver lake	150,000
J. V. Berens, Wild Rose	Hills lake	100,000

Distribution of Fish.

WALL-EYED PIKE FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
WAUSHARA COUNTY—Continued.		
B. A. Jacklin, Red Granite	Lake Pearl	100,000
Otto Rodoll, Wautoma	Crystal lake	100,000
W. A. Bugh, Wautoma	Johns lake	100,000
Edw. F. Heuer, Wautoma	Round lake	100,000
Chris. Ellickson, Wautoma	Tibett lake	100,000
C. H. Russell, Madison	Silver lake	200,000
Willis Edson, Hancock	Pine lake	100,000
Geo. M. Scott, Hancock	Fish lake	100,000
W. H. Campfield, Hancock	Pine lake	100,000
Harwood Preno, Hancock	Fish lake	100,000
Ed. O'Connor, Hancock	Fish lake	100,000
B. F. Hales, Hancock	Hancock lake	100,000
L. F. Kelley, Hancock	Hancock lake	50,000
W. A. Roblier, Coloma Station	Pleasant lake	100,000
		2,000,000
WINNEBAGO COUNTY—		
John Maag, Oshkosh	Lake Winnebago	4,800,000
WOOD COUNTY—		
Emil S. Kliner, Marshfield	Little Eau Plaine river	150,000
R. H. Treat, Abbotsford	Little Eau Plaine river	100,000
Wm. Paape, Vesper	Maple river	100,000
H. E. Herrick, Nekoosa	Nekoosa pond	225,000
Alex Muir, Grand Rapids	Mill pond	150,000
H. H. Voss, Grand Rapids	Consolidated pond	150,000
W. W. Meade, Grand Rapids	In pond above dam	150,000
James Walsh, Grand Rapids	Consolidated pond	150,000
Guy R. Wood, Grand Rapids	Consolidated pond	150,000
Chas. Pomainville, Grand Rapids	Wisconsin river	150,000
W. T. Jones, Grand Rapids	Wisconsin river	150,000
H. A. Sampson, Grand Rapids	Wisconsin river	150,000
Archie McMillan, Grand Rapids	Wisconsin river	150,000
F. E. Kellner, Grand Rapids	Wisconsin river	150,000
Henry C. Demitz, Grand Rapids	Wisconsin river	150,000
Geo. W. Baker, Grand Rapids	Wisconsin river	150,000
E. S. Renne, Grand Rapids	Biron lake	150,000
		2,525,000
Total wall-eyed pike fry planted, 1908		112075,000

Distribution of Fish.

BLACK BASS FRY PLANTED, 1908.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
ADAMS COUNTY—		
J. B. Hill, Friendship	Friendship and Arkdale ponds	2,000
T. Wickersham, Friendship	Friendship Mill pond	1,000
		3,000
ASHLAND COUNTY—		
J. Steffeck, Mellen	Caroline lake	2,000
F. P. Simmonds, Mellen	English lake	1,000
F. C. Shephard, Mellen	Herbert lake	1,000
C. F. Peterson, Mellen	Spider lake	1,000
John Tobin, Mellen	Iron river	1,000
A. G. Bjork, Mellen	Long lake	1,000
H. H. Yankee, Butternut	Hoffman lake	1,000
H. Buechner, Butternut	Butternut lake	1,000
A. G. Bastedo, Butternut	Butternut lake	1,000
A. G. McAnulty, Butternut	Butternut lake	1,000
F. Kleinsteiber, Butternut	Butternut lake	1,000
Wm. Lindermeyer, Butternut	Butternut lake	1,000
W. E. Dillon, Butternut	Butternut lake	2,000
		15,000
BAYFIELD COUNTY—		
D. H. Hubbard, Cusson	Basswood lake	2,000
N. C. Drew, Cusson	Evert lake	1,000
Ed. Olson, Cusson	Craig lake	1,000
Chas. Olson, Cusson	Trout lake	1,000
Henry La Crosse, Superior	Swede lake	1,000
Barney Devine, Iron River	Hart lake	1,000
Thomas Devine, Iiron River	Crow lake	1,000
J. A. Coats, Iron River	Pike lake	1,000
John Drake, Iron River	Perch lake	2,000
Gust Headquist, Iron River	Pettingil lake	1,000
Kopplin & Kopplin, Iron River	Eight-mile lake	1,000
C. D. Rogers, Iron River	Little Spider lake	1,000
H. L. Lea, Iron River	Iron lake	1,000
A. H. Miles, Iron River	Pike lake	2,000
		17,000
BUFFALO COUNTY—		
M. H. Amidon, Mondovi	Emerald lake and pond	2,000
CLARK COUNTY—		
Gilbert Johnson, Neillsville	O'Neil creek Tributary, Black river	1,000
F. D. Condit, Neillsville	Tributary Black river	1,000
S. J. Barrett, Neillsville	Black river	1,000
Geo. K. Redmond, Neillsville	Black river	1,000
		4,000
COLUMBIA COUNTY—		
Jos. Roup, Portage	Big Silver lake	4,000
F. H. Smith, Pardeeville	Pardeeville Mill pond	2,000
R. W. Langdon, Pardeeville	Spring lake	2,000
J. E. Horton, Pardeeville	Pardeeville Mill pond	2,000
		10,000
CRAWFORD COUNTY—		
J. O. Davidson, Madison	Kickapoo river	4,000
Geo. H. Davidson, Soldiers Grove	Kickapoo river	4,000
		8,000

Distribution of Fish.

BLACK BASS FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
DANE COUNTY—		
Jas. Nevin, Madison	Monona lake	7,000
Jas. Nevin, Madison	Mendota lake	9,000
Geo. Williamson, Madison	Waubesa lake	5,000
Jas. Nevin, Madison	Wingra lake	4,000
W. F. Gilman, Stoughton	Kegonsa lake	2,000
J. H. Campbell, Stoughton	Kegonsa lake	2,000
S. Y. Ames, Stoughton	Kegonsa lake	2,000
J. H. Weber, Stoughton	Kegonsa lake	2,000
A. M. Field, McFarland	Waubesa lake	2,000
M. D. Larson, McFarland	Waubesa lake	2,000
E. N. Edwards, McFarland	Waubesa lake	2,000
O. Gustaveson, London	Lake Ripley	2,000
H. L. Cowles, London	Lake Ripley	2,000
E. D. Herring, Cross Plains	Black Earth creek	2,000
H. G. Goodlad, Black Earth	Mann creek	2,000
G. C. Roemhild, Black Earth	Blue Mounds creed	1,000
Clarence Willard, Mazomanie	Lake Marion	2,000
G. H. Clough, Mazomanie	Lake Marion	1,000
O. P. Sorenson, Marshall	Waterloo pond	2,000
		53,000
DODGE COUNTY—		
D. D. Evans, Randolph	Lake Emily	2,000
Murphy Bros., Fox Lake	Fox lake	3,000
W. C. North, Fox Lake	Fox lake	4,000
Jos. Rowell, Beaver Dam	Beaver Dam lake	4,000
P. A. Pan, Hustisford	Hustisford lake	1,000
O. W. Radloff, Hustisford	Hustisford lake	1,000
Geo. M. Bagley, Neosho	Neosho mill pond	1,000
Anton Welsch, Mayville	Rock river, below dam	1,000
R. J. Langenbach, Mayville	Rock river, between dams	1,000
C. W. Lamoreaux, Mayville	Rock river	1,000
Geo. Engel, Mayville	Rock river	1,000
H. Schwartzmueller, Mayville	Kekoskee lake	1,000
Eugene Ziegler, Mayville	Rock river, above dam	1,000
		22,000
DOOR COUNTY—		
Samuel Perry, Forestville	Ahnapee river	2,000
George Schmitz, Forestville	Ahnapee river	2,000
Frank Schlosser, Forestville	Ahnapee river	2,000
		6,000
DOUGLAS COUNTY—		
Nebagamon Lbr. Co., Lake Nebagamon	Lake Nebagamon	2,000
Hal. J. Hume, Lake Nebagamon	Minnesung lake	1,000
W. S. Carr, Lake Nebagamon	Lake Nebagamon	2,000
Chas. E. Solberg, Brule	Hoodeaux lake	1,000
J. A. Lansworth, Brule	Mucks lake	1,000
Carl E. Carlson, Brule	Rush lake	1,000
W. J. Conness, Brule	Lake Rallons	1,000
Oscar W. Laquist, Brule	Sand lake	1,000
		10,000
DUNN COUNTY—		
H. C. Ivenfeldt, Menomonie	Lake Menomonie and Tribs...	1,000
F. A. Vasey, Menomonie	Lake Menomonie	1,000
Oscar Melbye, Menomonie	Lake Menomonie and Tribs...	1,000

Distribution of Fish.

BLACK BASS FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
DUNN COUNTY—Continued.		
H. W. Johnson, Menomonie	Lake Menomonie and Tribs...	1,000
Ole Kausrud, Menomonie	Red Cedar river	1,000
W. S. Swenson, Menomonie	Red Cedar river	1,000
		6,000
EAU CLAIRE COUNTY—		
I. Shoudy, Fairchild	Several Tribs. of North Fork of Eau Claire river	3,000
Chas. Stiding, Altoona	Altoona lake	1,000
Wm. Hawker, Altoona	Altoona lake	1,000
W. L. Botsford, Altoona	Altoona lake	1,000
L. A. McKinley, Altoona	Altoona lake	1,000
J. Baumberger, Eau Claire	Eau Claire river	2,000
J. Kopplin, Eau Claire	Eau Claire river	2,000
W. J. Davis, Eau Claire	Clear creek pond	2,000
A. E. Ulrich, Eau Claire	Dells pond	1,000
L. Kortsch, Eau Claire	Chippewa river	2,000
John Brog, Eau Claire	Eau Claire river	1,000
		16,000
IRON COUNTY—		
A. Skud, Mercer	Mercer lake	2,000
JACKSON COUNTY—		
Ira Bowman, Black River Falls	Black river	2,000
F. W. Cole, Black River Falls	Black river and Tributaries	2,000
J. C. Tallack, Black River Falls	Perry creek	1,000
A. C. Fisher, Black River Falls	Black river	1,000
M. N. Davidson, Merrillan	Trows pond	1,000
J. C. Taggart, Merrillan	Grist Mill pond	1,000
E. E. Moore, Merrillan	Mill pond	1,000
J. H. Williams, Merrillan	Trows pond	1,000
		10,000
JEFFERSON COUNTY—		
Chas. Williams, Palmyra	Palmyra lake	2,000
Dell Buzzell, Palmyra	Spring lake	2,000
F. G. Ewins, Palmyra	Upper Spring lake	2,000
Jos. Stoppembach, Jefferson	Rock river	2,000
B. C. Harris, Palmyra	Pleasant lake	2,000
O. L. Roessler, Jefferson	Rock river	2,000
W. H. Weld, Fort Atkinson	Rock river	2,000
F. P. Mansfield, Lake Mills	Rock lake	4,000
Edw. Schultz, Waterloo	Maunesha river and pond	2,000
A. H. Hartvig, Watertown	Rock river	2,000
		22,000
JUNEAU COUNTY—		
S. E. Gleason, Camp Douglas	Big Lemonweir river	2,000
C. J. Phillips, Camp Douglas	Lemonweir river	2,000
G. M. Reed, Necedah	Yellow river	2,000
		6,000
KEWAUNEE COUNTY—		
Felix Moraux, Luxemburg	Big Scarbora and Trudell Mill pond	2,000
Trudell Kalhofer, Luxemberg	Scarbora river	2,000
Ernest Bruemmer, Algoma	South Branch Ahnapee river	2,000
Van J. Engle, Kewaunee	Kewaunee river	2,000
Jos. F. Valecka, Kewaunee	Kewaunee river	2,000
		10,000

Distribution of Fish.

BLACK BASS FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
MANITOWOC COUNTY—		
Chas. M. Krumm, Manitowoc	English lake	1,000
M. Staehle, Manitowoc	Manitowoc river	1,000
Ed. Miller, Manitowoc	Weirs lake	1,000
John Wegner, Manitowoc	Glomsky lake	1,000
Peter Wagner, Cleveland	Wagner pond	2,000
		6,000
MARATHON COUNTY—		
Wm. A. Ranka	Lake Go-to-it	1,000
Louis Tharson, Norrie	Mayflower lake	1,000
F. H. Jewson, Norrie	Mayflower lake	1,000
Paul Kubesk, Norrie	Lake Go-to-it	1,000
H. H. Clausen, Norrie	Mayflower lake	1,000
R. Wojsich, Hatley	Narrow lake	2,000
Anton Milanoski, Pike Lake	Pike lake	2,000
Frank Koskey, Pike Lake	Pike lake	1,000
Ole J. Haealdron, Galloway	Forest lake	2,000
A. J. Torgerson, Galloway	Walsh lake and Galloway Mill pond	2,000
F. R. Guenther, Knowlton	Eau Claire river	2,000
V. J. Splaine, Wausau	Half-moon lake	2,000
F. B. Fullmer, Schofield	Eau Claire river	2,000
J. E. McKahan, Wausau	Eau Plaine river	1,000
A. J. Dern, Wausau	Wisconsin river	1,000
Alex Fehl, Wausau	Little Rib river	1,000
C. S. Curtis, Wausau	Little Rib river	2,000
John Fehl, Wausau	Rib river	2,000
		27,000
MILWAUKEE COUNTY—		
J. Axelson, Milwaukee	Wind lake	2,000
ONEIDA COUNTY—		
Mr. Johnson	Mercer lake	2,000
H. Hanson	Squirrel lake	8,000
Robert Ripple, Woodruff	Minocqua lake	32,000
Robert Ripple, Woodruff	Tomahawk lake	45,000
A. Weaver	Johnson lake	3,000
H. Chapin	Clear lake	10,000
T. M. Bolger, Minocqua	Baker lake	5,000
J. Bolger, Minocqua	Bolger lake	4,000
		109,000
OZAUKEE COUNTY—		
Peter Leder, Grafton	Milwaukee river	2,000
W. J. Bichler, Belgium	Grahsee lake	2,000
		4,000
PORTAGE COUNTY—		
W. L. Selmer, Rosholt	Three lakes	1,000
Lewis Gutho, Rosholt	Three lakes	1,000
Wm. Plopper, Rosholt	Lake Kiolbasso	1,000
I. L. Rice, Rosholt	Gutho lake	1,000
G. S. Gensen, Rosholt	Muddy lake	1,000
		5,000

Distribution of Fish.

BLACK BASS FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
PRICE COUNTY—		
J. E. Feely, Fifield	Pike and Round lakes	2,000
Patterson Bros., Fifield	Perch lake	1,000
F. S. Burch, Fifield	Burch lake	1,000
		4,000
RACINE COUNTY—		
Chas. Flett, Waterford	Fox river and Tributaries	2,000
B. Lavin & Sons, Kansasville	Eagle lake	3,000
		5,000
RICHLAND COUNTY—		
T. K. Fries, Lone Rock	Long lake	2,000
H. W. Haskell, Lone Rock	Lake La Belle	2,000
Geo. J. Carswell, Lone Rock	Mill pond	2,000
J. E. Coffland, Richland Center	Bowen's Mill pond	2,000
R. L. Thurber, Richland Center	Mill pond on Pine river	2,000
		10,000
ST. CROIX COUNTY—		
U. C. Ryan, Roberts	Twin lakes	1,000
Robert Douglas, Roberts	Twin lakes	2,000
Mike Steckmeyer, Roberts	Dry Dam lake	1,000
		4,000
SAUK COUNTY—		
S. J. Hood, Baraboo	Devils lake	2,000
A. D. Dorsett, Baraboo	Devils lake	2,000
E. G. Marriott, Baraboo	Devils lake	2,000
A. G. Buckley, Baraboo	Mirror lake	2,000
H. M. Acott, Baraboo	Mirror lake	2,000
Oscar Gust, Baraboo	Mirror lake	2,000
W. O. Hackett, North Freedom	Mirror lake	2,000
R. D. Sherwood, Spring Green	Wisconsin river	2,000
F. B. Simpson, Spring Green	Wisconsin river	1,000
		17,000
TAYLOR COUNTY—		
O. H. Martens, Medford	Richter lake	2,000
Herman Richter, Medford	Richter lake	2,000
K. J. Turquardt, Medford	Bahn's lake	1,000
E. S. Schwenne, Medford	Sackett's lake	1,000
C. H. Howard, Medford	Lake Esidore	1,000
E. D. Simerson, Medford	Lake Esidore	1,000
Martin Thorn, Medford	Nigger lake	1,000
Mark Ehle, Medford	Sackets lake	1,000
		10,000
TREMPEALEAU COUNTY—		
O. T. Gilbert, Blair	Trempealeau river	2,000
Lon. Duxbury, Blair	Trempealeau river	1,000
Tom Johnson, Blair	Trempealeau river	1,000
T. T. Gilbert, Blair	Trempealeau river	1,000
H. Schaefer, Independence	Independence mill pond	1,000
Enoch Jelen, Independence	Elk creek mill pond	1,000
Milton Zimmer, Independence	Independence mill pond	1,000
Jacob Jackson, Independence	Independence mill pond	2,000
C. R. Miller, Arcadia	Trempealeau river	2,000
F. R. Paine, Arcadia	Half-moon lake	2,000
G. O. Linderman, Osseo	Summer Mill pond	1,000
John Crow, Osseo	Beef river	1,000
A. G. Cox, Osseo	South Branch Beef river	1,000
Jas. McIntyre, Osseo	Beef river	1,000

Distribution of Fish.

BLACK BASS FRY PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
TREMPEALEAU COUNTY—Continued.		
W. S. Gilpin, Osseo	South Branch Beef river	1,000
A. H. Brandon, Osseo	Liderman's pond	1,000
N. I. Gilbert, Eleva	Mill pond	2,000
		22,000
VERNON COUNTY—		
Clark Brokaw, Rockton	Kickapoo river	2,000
VILAS COUNTY—		
E. A. Everett, Eagle River	Island, Gordon and Meta lakes	10,000
Jesse Coon, Woodruff	Trout lake	10,000
John Mann, Woodruff	Trout lake	6,000
A. Doolittle, Woodruff	Trout lake	8,000
A. B. Dick, Woodruff	Crooked lake	8,000
Gus. Anderson, Woodruff	Star lake	3,000
D. A. Kahn, Woodruff	Brandy lake	3,000
Mr. Backus, Saynor	Sand lake	5,000
Ed. Wallace, Woodruff	Star lake	5,000
Christ Oleson, Woodruff	Little Muskellunge lake	3,000
Yawkey Bissell Lbr. Co., Arbor Vitae	Arbor Vitae lake	10,000
		71,000
WALWORTH COUNTY—		
W. A. Sharp, Elkhorn	Lauderdale lakes	4,000
W. B. V. Holloway, Elkhorn	Holden's lake	2,000
W. T. Sherman, Elkhorn	North lake	2,000
John O. Anderson, Delavan	Turtle lake	2,000
Chas. A. Sage, Delavan	Delavan lake	4,000
Brownell Bulkley, Whitewater	Lauderdale lakes	4,000
A. M. Hanson, Whitewater	Whitewater lake	2,000
		20,000
WASHINGTON COUNTY—		
John Rosenheimer, Schleisingerville	Big Cedar lake	2,000
Wm. Shinners, Hartford	Pike lake	2,000
Pottowatomie Club, North Milwaukee.	Pike lake	1,000
		5,000
WAUKESHA COUNTY—		
John C. Schuette, Muskego	Little Muskego lake	2,000
J. B. Whittacker, Menomonie Falls..	Lake Five	2,000
		4,000
WAUPACA COUNTY—		
Arthur Lindsay, Manawa	Little Wolf river	2,000
John Rasmussen, Ogdensburg	Mfll pond	2,000
C. H. Anderson, Scandinavia	Silver lake	3,000
A. Biedermann, Iola	Hatch lake	2,000
J. E. Phillips, Iola	Graham lake	2,000
		11,000
WOOD COUNTY—		
E. S. Renne, Grand Rapids	Wisconsin river	1,000
W. J. Dickson, Grand Rapids	Wisconsin river	1,000
John E. Daly, Grand Rapids	Wing lake	1,000
		3,000
Total black bass fry planted, 1908.		581,000

Distribution of Fish.

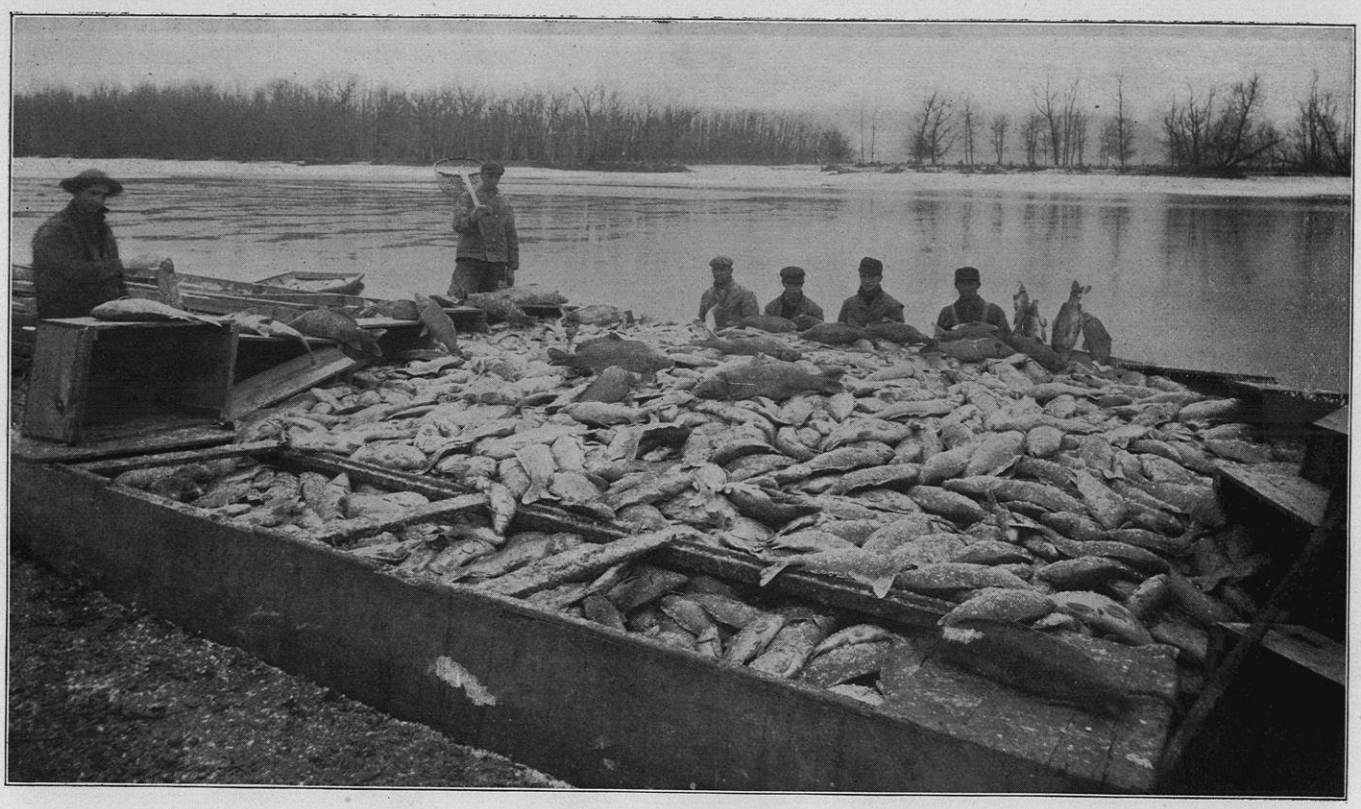
BLACK BASS FINGERLINGS PLANTED, 1908.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
COLUMBIA COUNTY—		
J. Frank Collins, Lodi	Fish lake	800
Horace Willis, Lodi	Crystal lake	800
E. A. Gowran, Portage	Silver lake	4,000
		5,600
DANE COUNTY—		
Arthur Sykes, Madison	Lake Mendota	5,200
Jas. Nevin, Madison	Lake Mendota	10,000
Arthur Sykes, Madison	Monona and Wingra lakes	10,000
		25,200
DODGE COUNTY—		
J. G. Smith, Theresa	Trib. to Rock river	800
FOND DU LAC COUNTY—		
P. G. Van Blarcom, Fond du Lac	Forest lake	800
W. W. Quick, Fond du Lac	Lake De Neveu	400
E. A. Galloway, Fond du Lac	Lake De Neveu	400
Wm. Wedde, Campbellsport	Lake Fifteen	400
P. A. Hoffman, Campbellsport	Spring lake	400
B. H. Rosenheimer, Kewaskum	Mill pond	800
		3,200
IOWA COUNTY—		
Calvert Spensley, Mineral Point	Pecatonica river	12,000
KENOSHA COUNTY—		
A. H. Bottleny, Bristol	Lake George	1,600
Wm. Kline, Twin Lakes	Twin lakes	2,000
Wm. Luke, Wheatland	Lily lake	800
Geo. Mutter, Silver Lake	Silver lake	800
F. H. Schenning, Silver Lake	Silver lake	1,600
C. W. Lictenberg, Camp Lake	Camp lake	800
		7,600
MONROE COUNTY—		
Emil Friske, Wilton	Mill pond	800
Chas. Todd, Wilton	West Branch of Slaten creek	800
O. F. Angle, Sparta	Walworth pond	800
Fred Brandt, Sparta	Perch lake	800
H. W. Barker, Sparta	La Crosse river	800
		4,000
ONEIDA COUNTY—		
Jas. Nevin, Madison	Minocqua lake	5,400
OZAUKEE COUNTY—		
John Weber, Cedarburg	Milwaukee river	11,000

Distribution of Fish.

BLACK BASS FINGERLINGS PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
RACINE COUNTY—		
C. S. Douglas, Fontana	Geneva lake	3,200
A. H. Barnes, Racine	Root river	1,600
A. H. Barnes, Racine	Root river	11,000
		15,800
ROCK COUNTY—		
Peter Drafahl, Afton	Bass creek	1,200
L. E. Cunningham, Beloit	Rock river	1,200
C. L. Valentine, Janesville	Rock river	10,500
		12,900
VERNON COUNTY—		
Elias Fox, Hillsboro	Mill pond	400
R. Hammer, Hillsboro	Hillsboro Mill pond	400
C. T. Knappman, Hillsboro	Holefeldt lake	400
John Hainstick, Hillsboro	South Fork of Baraboo river.	400
Gus Kolb, Hillsboro	West Fork of Baraboo river..	400
		2,400
WALWORTH COUNTY—		
Aug. Rothe, Genoa Junction	Powers lake	2,000
Sage & Co., Delavan	Delavan lake	12,000
		14,000
WASHINGTON COUNTY—		
B. Brentzman, Milwaukee	Lake Five	800
Jacob Cramer, Milwaukee	Lake Five	800
A. Barnes, Barton	Mill dam on East Branch of Milwaukee river	400
Jas. A. Kircher, Barton	Dricken lake	400
Paul Hedeburg, West Bend	Hedeburg lake	400
John Harlmus, West Bend	Harlmus lake	400
Michael Hacker, West Bend	Cedar lake	400
		3,600
WAUKESHA COUNTY—		
A. J. Coats, Mukwonago	Spring lake	800
Sidney Lean, Dousman	Silver lake	1,600
Foster Phelps, Waukesha	Pewaukee lake	3,200
A. Gallagher, Delafield	Upper Nemahbin and Nagawicka lakes	12,450
Foster Phelps, Waukesha	Pewaukee lake	3,750
Wm. Kunz, Delafield	Golden lake	1,500
John Peterson, Delafield	Petersons, lake	1,000
Tom Atkins, Waukesha	.....	1,000
Dr. L. A. Meyers, Oconomowoc	Oconomowoc and La Belle lakes	8,000
Geo. Savoy, Pewaukee	Pewaukee lake	11,000
		44,300
WAUPACA COUNTY—		
Edw. E. Browne, Waupaca	Chain of lakes	10,000



PART OF A CATCH OF 55,000 POUNDS OF CARP, FROM MISSISSIPPI RIVER, BAY CITY, WIS.

Distribution of Fish.

BLACK BASS FINGERLINGS PLANTED, 1908—Continued.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
WAUSHARA COUNTY—		
Chas. Russell, Madison	Silver and Crystal lakes	2,000
WINNEBAGO COUNTY—		
Joan Maag, Oshkosh	Lake Winnebago	9,000
WOOD COUNTY—		
Geo. N. Wood, Grand Rapids	Wisconsin river	10,000
Total black bass fingerlings planted, 1908		198,800

LAKE TROUT FRY PLANTED, 1908.

Where Planted.	No. of Fish.
In Lake Michigan out from Sheboygan	140,000
In Lake Michigan out from Marinette	175,000
In Lake Michigan out from Port Washington	525,000
In Lake Michigan out from Sturgeon Bay	455,000
In Lake Michigan out from Racine	700,000
In Lake Michigan out from Manitowoc	700,000
In Lake Michigan out from Algoma	175,000
In Green Bay out from Sturgeon Bay	822,500
In Lake Winnebago, Winnebago county	52,500
In Fence Lake, Vilas county	300,000
In Clear Lake, Oneida county	300,000
In Pelican Lake, Oneida county	300,000
In Court Oreilles lake, Sawyer county	300,000
In Gordon lake, Ashland county	300,000
In Pine lake, Chippewa county	300,000
In St. Croix lake, Douglas county	75,000
In Springstedt, French and Boot lakes, Iron county	225,000
In Big lake, Iron county	75,000
In Long lake, Vilas county	300,000
In Pike lake, Bayfield county	75,000
Chequamegon Bay, Lake Superior	4,270,000
In Lake Superior, off Presque Island	389,000
In Lake Superior, off Raspberry Island	450,000
In Lake Superior, off Sand Island	450,000
In Lake Superior, off York Island	500,000
Total lake trout fry planted, 1908	12,345,000

Distribution of Fish.

WHITEFISH FRY PLANTED, 1908.

Where Planted.	No. of Fish.
In Lake Michigan out from Sheboygan	1,320,000
In Lake Michigan out from Manitowoc	2,200,000
In Lake Michigan out from Port Washington	3,300,000
In Lake Michigan out from Marinette	1,100,000
In Lake Michigan out from Oconto	2,200,000
In Green Bay out from Sturgeon Bay	2,090,000
Total whitefish fry planted, 1908	12,210,000

MUSKELLUNGE FRY PLANTED, 1908.

Name and Post Office of Applicant.	Where Planted.	No. of Fish.
ONEIDA COUNTY— Robert Ripple, Woodruff	Minocqua lake	226,000
VILAS COUNTY— Robert Ripple, Woodruff	Little Arbor Vitae lake	226,000
Total muskellunge fry planted, 1908		452,000

MISCELLANEOUS DISTRIBUTION, 1908.

	No.
Trout and Gold-fish furnished fairs, fountains and aquariums	439
Mature rainbow trout, male fish, planted in Nine-spring creek, Dane county	1,330
Planted in Nemacogin river at Cable, Bayfield county, grayling fry	50,000
Furnished Nebraska Fish Commission in exchange for gold fish, eyed lake trout eggs	100,000
Planted in Clear Lake, Oneida county, steel-head trout fry	50,000
Planted in Minocqua and Tomahawk lakes, Oneida county, pickerel fry	320,000
Planted in Lake Mendota, Dane County, impregnated pickerel eggs collected from the Catfish river	5,530,000
Planted in Mississippi river and contiguous waters commercial and game fishes of various kinds, estimated	1,054,000
Total	7,105,769

Distribution of Fish.

SUMMARY OF OUTPUT OF HATCHERIES AND STATIONS, 1908.

MADISON HATCHERY.		
Brook trout, advanced fry	*1,040,000	
Rainbow trout, advanced fry	*1,294,500	
Mature rainbow trout	1,330	
Gold fish and trout furnished aquariums	144	
Total output, Madison hatchery		2,335,974
BAYFIELD HATCHERY.		
Brook trout, advanced fry	*1,455,500	
Rainbow trout, advanced fry	*919,000	
Lake trout fry	8,600,000	
Grayling fry	50,000	
Lake trout eggs furnished Nebraska Fish Commission in exchange	100,000	
Furnished fairs, fountains, aquariums, trout of various ages	295	
Total output, Bayfield hatchery		11,124,795
OSHKOSH HATCHERY.		
Lake trout fry	3,745,000	
Whitefish fry	12,210,000	
Wall-eyed pike fry	27,500,000	
Total output, Oshkosh hatchery		43,455,000
MINOCQUA HATCHERY.		
Wall-eyed pike fry	59,625,000	
Black bass fry	322,000	
Muskellunge fry	452,000	
Pickerel fry	320,000	
Steel-head trout fry	50,000	
Total output, Minocqua hatchery		60,769,000
DELAFIELD HATCHERY.		
Wall-eyed pike fry	24,950,000	
Black bass fry	259,000	
Black bass fingerlings	64,000	
Total output, Delafield hatchery		25,273,000
FROM MISSISSIPPI RIVER SLOUGHS.		
Black bass fingerlings	133,900	
Other kinds, estimated	1,054,000	
Total optput, from Mississippi river		1,187,900
FROM CAT-FISH RIVER.		
Pickerel, impregnated eggs		5,530,000
Total output, from all sources		149,676,569

* Includes fry retained at hatchery.

SUMMARY OF FISH PLANTED BY WISCONSIN FISH COMMISSION SINCE ESTABLISHMENT.

Year	Brook trout.	Rainbow trout.	Salmon.	Carp.	White-fish.	Lake trout.	Wall-eyed pike.	Black bass.	White bass.	Muskel-lunge.	Pickerel.	Yellow Perch.	Miscel-laneous.	Total.
1877..	179.000	.....	67.500	.....	6,295,000	1,676,000	.....	.....	.....	.....	.....	.....	.....	8,217,500
1878..	93.000	.....	77,800	.....	8,850,000	2,980,000	.....	.....	.....	.....	.....	.....	.....	12,800,000
1879..	.....	.....	88.210	.....	5,000,000	.....	.....	.....	.....	.....	.....	.....	.....	5,088,210
1880..	930.250	.....	.....	.....	5,800,000	3,600,000	.....	.....	.....	.....	.....	.....	.....	10,330,250
1881..	1,088,000	.....	.....	‖163	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,088,163
1882..	828,590	.....	.....	.....	6,000,000	.....	.....	.....	.....	.....	.....	.....	.....	6,828,590
1883..	1,330,000	.....	.....	.....	16,000,000	.....	8,000,000	.....	.....	.....	.....	.....	.....	25,330,000
1884..	2,005,000	95,000	.....	‖253	17,000,000	.....	9,700,000	.....	.....	.....	.....	.....	.....	28,800,253
1885..	1,510,000	600,000	.....	‖6,765	.....	.....	14,500,000	.....	.....	.....	.....	.....	.....	16,616,765
1886..	2,275,000	630,000	.....	‖556	33,210,000	.....	3,450,000	.....	.....	.....	.....	.....	.....	39,571,556
1887..	2,900,000	1,345,000	.....	‖17,165	31,500,000	500,000	8,800,000	.....	.....	.....	.....	.....	.....	45,092,165
1888..	2,285,000	1,590,000	.....	‖25,512	18,000‖000	700,000	4,450,000	.....	.....	.....	.....	.....	.....	27,050,512
1889..	2,190,000	2,615,000	.....	5,230	30,000‖000	5,850,000	14,050,000	.....	.....	.....	.....	.....	.....	54,710,230
1890..	3,320,000	3,460,000	.....	‖35,591	27,600,000	*27,472,500	14,680,000	.....	.....	.....	.....	.....	.....	76,568,091
1891..	2,620,000	2,415,000	.....	‖9,855	35,000,000	*1,536,000	6,000,000	.....	5,200,000	.....	.....	.....	.....	52,780,855
1892..	3,245,000	3,340,000	.....	‖8,700	14,000,000	*10,704,000	13‖575,000	.....	.....	.....	.....	.....	.....	44,872,700
1893..	1,635,000	1,675,000	.....	‖5,050	35,000,000	*14,249,000	5,500,000	‖29,000	.....	.....	.....	.....	.....	58,096,050
1894..	3,785,000	2,605,000	.....	‖8,125	33,000,000	*10,777,000	9,600,000	‖73,000	$4,960	.....	.....	.....	.....	59,853,085
1895..	2,556,000	1,470,000	.....	‖8,525	15,000,000	*22‖100,000	23,100,000	‖116,500	$2,345	.....	.....	.....	.....	64,275,670
1896..	3,110,000	1,611,000	.....	.....	27,500,000	†22,710,000	25,250,000	‖156,635	$13,500	.....	.....	.....	.....	69,120,089
1897..	1,949,000	1,241,000	.....	.....	18,000,000	‡‡10,010,000	23,300,000	‖4,500	$9,115	1,100,000	.....	.....	.....	55,613,615
1898..	1,952,500	1,180,000	.....	.....	3,000,000	7,362,000	53,980,000	‖112,200	$23,420	.....	.....	.....	.....	67,760,120
1899..	2,238,000	1,095,500	.....	.....	.....	16,848,000	60,190,000	‖68,665	$15,100	.....	.....	.....	.....	80,455,755
1900..	2,393,000	1,653,000	.....	.....	.....	30,797,500	69,850,000	.....	.....	100,000	7,090,000	.....	.....	111,793,500
1901..	1,866,500	1,068,500	.....	.....	34,450,000	19,980,000	78,200,000	‖44,270	.....	472,500	*5840,000	.....	.....	142,921,770
1902..	2,569,000	1,299,000	.....	.....	66,820,000	17,877,000	37,325,000	‖10,200	.....	80,000	.....	.....	.....	126,150,200
1903..	1,512,500	1,050,000	.....	.....	37,500,000	16,168,000	46,170,000	‖318,000	.....	100,000	*2080,000	.....	200,125	105,089,625
1904..	2,090,000	2,283,750	.....	.....	20,375,000	20,462,000	37,825,000	‡549,900	.....	50,000	.....	.....	100,200	83,737,850
1905..	2,937,000	1,362,000	.....	.....	15,278,000	18,803,000	76,800,000	‡341,300	‖1,463,000	50,000	.....	‖723,880	252,700	118,010,980
1906..	2,442,500	1,673,000	.....	.....	53,780,000	16,107,500	79,140,000	‡940,550	‖3,500	800,000	*5180,000	‖18,000	23,575	160,409,125
1907..	**1,980,000	1,558,500	.....	.....	27,025,000	19,724,000	44,900,000	‡409,500	‖1,250	420,000	†2870,000	.....	146,026	99,034,276
1908..	**2,272,000	2,098,500	.....	.....	12,210,000	12,345,000	112,075,000	‡779,800	.....	†452,000	5,850,000	.....	1,255,769	149,338,069

*Impregnated eggs, † eggs and fry, ‡ fry and fingerlings, § adult fish, ‖ fingerlings, ** advanced fry.
Note—Fish planted in fry stage unless otherwise indicated.

Distribution of Fish.

DISTRIBUTION OF FISH AND EGGS FOR WISCONSIN WATERS BY THE BUREAU OF FISHERIES DURING FISCAL YEAR ENDING JUNE 30, 1907.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	CATFISH			
La Crosse	Mississippi river			100,000
Mauston	Bush creek			300
Total				100,300
	WHITEFISH			
Aminicon river	Lake Superior		2,400,000	
Oshkosh	Wis. Fish Commisssion	25,000,000		
	STEELHEAD TROUT			
Gordon		20,000		
	RAINBOW TROUT			
Alma Center	Cisney creek			1,000
Arcadia	Bishop creek			7,500
	Eagles Valley creek			6,000
	Gilman creek			2,000
	Haines creek			2,000
	Holcomb Coulee creek			6,000
	Hunters creek			6,000
	Kried Valley creek.			2,000
	Lewis Valley creek			3,000
	Long creek			6,000
	Montana creek			6,000
	Rocky Run			6,000
	Sandy creek			6,000
	Willow creek			1,500
	Bridge creek			1,500
Augusta	Tennison creek			6,000
Blair	Vosse Coulee creek			6,000
	Furnis Hollow creek			1,500
Edmund	Corrigan			20,000
Galesville	McCooleys creek			20,000
	Silver creek			15,000
	South branch of Beaver creek			10,000
Independence	Ammundson creek			5,000
	Borst Valley creek			7,500
	Branch of Chimney Rock creek			5,000
Menomonie	Kings creek			6,000
	Lambs creek			9,000
	Silver creek			9,000
	Wilson creek			12,000
Prentice	Jump river			3,000
Solon Springs	Long lake			5,000
Sparta	Bailey creek			1,632
	Bailey creek			1,632
	Beaver creek			1,632
	Leon creek			1,632
	Lyons creek			1,632
	Tarr creek			1,632

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	RAINBOW TROUT—Con.			
Trempealeau county	Fox creek			1,000
West Salem	Bells Coulee creek			1,000
	Browns creek			1,000
	Browns Valley creek			1,200
	Fleming creeek			1,500
	Troman creek			1,300
Whitehall	Barlow Valley creek			6,000
	Beaver creek			6,000
	Hay creek			6,000
	North branch of Elk creek			6,000
	South branch of Elk creek			6,000
				277,660
	LANDLOCKED SALMON			
Woodruff	Wis. Fish Commission	20,000		
	LAKE TROUT			
Brule river	Lake Superior			240,000
Iron River	Lake Superior		160,000	
Oshkosh	Wis. Fish Commission	14,500,000		
Sand Island	Lake Superior		160,000	
Solon Springs	Circle lake			12,000
Total		14,500,000	320,000	252,000
	BROOK TROUT			
Alma Center	Arno creek			1,000
	Halls creek			1,200
	Stillman Branch			1,000
	Town creek			1,000
Almena	Hay river			1,000
Amherst	Howard creek			600
Arcadia	American Valley creek			2,300
	Bennings creek			1,300
	Eagle Valley creek			300
	French creek			1,300
	Gilman creek			2,000
	Haines creek			1,000
	Holcomb Coulee creek			400
	Hunter creek			300
	Kreid Valley creek			2,000
	Long creek			500
	Louis Valley creek			300
	Mineral Spring brook			1,000
	Montana creek			400
	Muddy creek			300
	Riley creek			2,300
	Sandy creek			300
	Scharlow Valley creek			1,400
	Stony creek			400
	Trout Run			2,000

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	BROOK TROUT—Con.			
Augusta	Bridge creek			500
	Browns creek			200
	Cold creek			200
	Coon Gut creek			300
	Diamond creek			200
	Kirkhams creek			200
	Little Sand creek			200
	Piss creek			300
	Sand creek			300
	Thompson creek			600
	Travis creek			200
	Turner creek			200
Baldwin	Kinnickinnic creek			500
	Parker creek			300
Bangor	Adams Valley creek			200
	Big creek			500
	Burns creek			900
	Dutch creek			500
	Fish creek			300
	Sand creek			200
Barneveld	Blue Mound Branch			500
	Price creek			200
	Trout creek			200
	Walnut Holllow creek			700
	Miller creek			800
Barron	Douglas creek			1,500
Black River Falls	Bear creek			800
Blair	Strum creek			800
	Vosse Coulee creek			400
	Seeley creek			200
Boscobel	Rocky Run			1,000
Bright	Stony creek			600
	Pipen Valley creek			400
Buffalo County	Hatch creek			500
Chippewa Falls	Badger Hollow creek			200
Cobb	Headwaters of Blue river			500
	Eden creek			500
Colby	Porky creek			400
	South Fork of Poplar creek			300
	Eighteen Mile creek			2,500
Colfax	Trout creek			300
	Copper creek			12,000
Dedham	Empire creek			12,000
	Little Balsam creek			12,000
	Arkansaw creek			1,500
Durand	Branch of Otter creek			600
Edmund	Swamp creek			2,500
Elcho	Chester creek			300
Elk Mound	East Fork of Trout creek			300
	Peters creek			300
	Petersons creek			300
Elk Mound	Trout creek			300
	Wards Branch			300
	Willow creek			300
	Lower Inlet creek			700
Ellis Junction	Brewer creeek			1,200
Elroy	Garvin creek			1,200
	Hustler creek			400

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	BROOK TROUT—Con.			
Elroy—Con.	Mile creek			1,600
	North branch of Baraboo river			1,200
	Seymour creek			2,400
Fairchild	West branch of Baraboo river			1,000
	Hoffmans creek			200
	McLaren creek			500
	Seatts creek			300
	Whippoorwill creek			200
Fennimore	Branch of Blue river			2,000
	Green river			1,200
Fond du Lac	Persons creek			1,300
Fountain City	Bohris Valley creek			1,000
	Brandhorst creek			1,000
	Eagle Valley creek			1,500
	Harrison creek			1,000
	Holfel creek			1,000
	Jaegers creek			1,000
	Kellers creek			1,000
	Oak Valley creek			1,000
	Roesch creek			1,200
	Schoepps Valley creek			1,000
Foxboro	Balsam creek			12,000
	State Line creek			12,000
Galesville	Coon creek			600
	Dutch creek			600
	Grants creek			600
	Moose creek			1,000
	North Beaver creek			
Gordon	Applicant	200,000		
	Spring lake			2,000
Greenwood	Norwegian creek			300
	Rocky run			300
Hatley	Plover river			2,000
Hixton	French creek			2,000
	Hames creek			1,000
	Judgkins creek			1,000
	Mason creek			1,000
	North Branch			1,000
	Pigeon creek			2,000
	Schermerhorn creek			1,000
	Sheldon creek			1,000
	Sherwood creek			1,000
	Sly creek			1,000
	Smith creek			1,200
	South branch of Trempealeau creek			1,200
	Tank creek			1,200
	Hudson, Greenes Race			1,000
	Jefferson creek			1,000
	Ten Mile creek			1,000
	Willow river			2,500
Independence	Branch of Borst Valley creek			1,500
	Branch of Traverse Valley creek			2,000
	Chimney Rock creek			1,200
	Husselgard branch of Borst Valley creek			2,000
	Koenig creek			800

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	BROOK TROUT—Con.			
Independence—Con.	Little Elk creek			1,500
	Plumb creek			2,000
	Traverse Valley creek			1,500
	Veum branch of Borst Valley creek			2,000
	Wickam creek			800
	Zimmers creek			800
La Crosse	Breidels creek			1,000
	Coon creek			2,000
	Crystal lake			1,000
	Irish Coulee creek			1,200
	Minnerts creek			1,000
Lancaster	Austin creek			200
	Borah creek			200
	Logget branch			200
	McPherson branch			200
	Milner branch			200
	Trollope creek			200
	Walker branch			200
La Valle	Spring creek			400
Lodi	Bowman creek			1,000
	Freyes creek			1,000
	Spring creek			1,000
Menomonie	Annis creek			1,000
	Beaver creek			1,500
	Blacks run			1,000
	Boland creek			1,000
	Clack creek			1,000
	Clarks creek			1,300
	Cowan creek			1,000
	Dunkard creek			1,000
	Galloway creek			1,000
	Gilbert creek			3,000
	Grubb creek			2,000
	Hall's creek			1,000
	Hay creek			1,200
	Home Farm brook			1,000
	Island creek			2,000
	Irving creek			1,500
	Jackson creek			1,000
	Johnson creek			1,000
	Lennon creek			1,000
	Little Beaver creek			1,000
	Little Elk creek			1,500
	McCarthy's branch			1,000
	Otter creek			1,000
	Rock creek			1,000
	Rush creek			1,200
	Shafers creek			1,000
	Simonson creek			1,000
	Smiths creek			1,000
	Spring creek			1,000
	Sinking creek			1,000
	Stoner creek			1,000
	Thumb creek			1,000
	Torgersons creek			1,000
	Varney creek			1,000
	White creek			1,000

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	BROOK TROUT—Con.			
Merrill	Copper creek			3,100
	Devil creek			1,500
	Newwood creek			1,500
	Pine creek			2,500
	Prairie river			600
Merrillan	Clear creek			200
	Duners creek			200
	Houghton creek			200
	Sand creek			200
	Sisna creek			1,000
	South branch			200
	South branch of Visnoe creek			1,000
	Van Herset creek			1,000
Midway	Half Way creek			1,200
Millstone	Clarks creek			2,000
	South branch of Robinson creek			1,500
	Stony creek			1,000
Mondovi	Armer Valley creek			400
	Big creek			400
	Carroll creek			300
	Ford creek			600
	Harrison creek			300
	McDonough creek			300
	Mill creek			1,000
	Pratt creek			300
	Rossman creek			500
	Silver creek			300
Neillsville	Mound creek			300
New Lisbon	White creek			1,500
New London	Nordman creek			200
Osceola	Applicant	25,000		
Plymouth	Mullet river			1,000
	North branch of Onion river			2,500
	Onion river			2,000
Port Wing	Flag river			12,000
Princeton	Snake creek			1,000
Rice Lake	Angler creek			1,000
	Barker creek			1,500
	Big Bear creek			1,500
	Browns creek			1,000
	Cobb creek			1,500
	Cranberry creek			1,000
	Deitz creek			1,000
	Desair creek			1,000
	German creek			1,200
	Hay river			2,000
	Heckey creek			1,500
	Hemlock creek			1,000
	Little Bear creek			1,500
	Little Scobia creek			1,000
	Little Spring creek			1,000
	Lost creek			1,000
	Meadow creek			1,200
	Miller creek			1,500
	Mud creek			1,000
	Overby creek			1,000
	Pigeon creek			1,000

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	BROOK TROUT—Con.			
Rice Lake—Con.	Pokegama creek			2,000
	Prairie creek			1,200
	Renville creek			1,000
	Rice creek			1,000
	Rock creek			1,500
	Rocky Canon creek			2,000
	Savage creek			1,000
	Silver creek			1,200
	South creek			1,000
	Spoon creek			1,000
	Spring creek			1,000
	Spur Nine creek			1,000
	Sucker creek			1,000
	Tescobia creek			1,000
	West branch of Rock creek			1,000
	Yellow river			1,500
Richland Center	Ash creek			1,000
	Bear creek			2,000
	Brush creek			1,000
	Camp creek			1,000
	Fancy creek			1,200
	Grinsells branch			1,000
	Hawkins creek			1,000
	Leatherburgs branch			1,000
	Little Willow creek			1,000
	Melancthon creek			1,500
	Mill creek			2,000
	Soules creek			1,000
	South branch Pine river			1,000
	West branch Pine river			1,000
	Willow creek			1,200
Ridgeway	Henstock and Dane creeks			1,200
	Henstock and Strutt creeks			200
Rosendale	Boyds creek			200
	Willow creek			1,200
Rusk	Mud creek			500
Scovills Crossing ..	Rock creek			500
Sparta	Beaver creek			300
	Big creek			400
	La Crosse river			600
	Silver creek			400
	Soper creek			400
	Squaw creek			400
	Walroth creek			400
	Walworth Pond			1,000
Spring Valley	Burghart creek			200
	Cady creek			400
	Eau Galle creek			800
	French creek			200
	Lohn creek			200
	Lousy creek			300
	Mines creek			200
	North Gilbert creek			300
	Rusk creek			1,000
	South Gilbert creek			200
Stitzer	Davis branch			200
	Legett branch			300
	Wagner branch			300

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	BROOK TROUT—Con.			
Taylor	Curran creek			2,000
	French creek			1,500
	Low creek			2,000
	Pine creek			1,500
	Skutley creek			2,000
	Vassar creek			2,000
Thorp	Sterling creek			1,200
Trempealeau county	Holcomb Coulee creek			400
	Norway Coulee creek			300
	Pine creek			300
	Tamarack creek			400
Viroqua	Beabout creek			1,000
	Bishop creek			1,400
	Brookville creek			400
	Brush creek			400
	Bunch creek			1,000
	Cedar run			400
	Coe creek			1,000
	Elk run			400
	Getter branch			1,600
	Harrison Hollow creek			400
	Hornby creek			1,400
	Jenson branch			1,000
	Meadow brook			400
	Pine Hollow creek			1,400
	Primers branch			1,000
	Root branch			1,000
	Seeys branch			1,000
	Sidie creek			400
	Springville branch			1,200
	Towerville branch			400
	Weber creek			1,000
	West branch of Kickapoo creek			600
Waldo	Briggs creek			200
Warrens	Lemonweir creek			2,000
	North branch of Lemonweir creek			2,000
Waupaca	Dayton brook			400
	Emmons creek			1,800
Wautoma	Basin creek			400
	White river			6,000
Westby	Bad Axe creek			400
	Bishop creek			400
	Branch of Bad Axe creek			1,000
	Dixon spring			1,000
	East branch of Coon creek			1,400
	Knapp creek			400
	Minor creek			400
	Otter creek			800
	Paulsrud creek			400
	Rogster creek			1,000
	Sanghus creek			1,000
	Sees creek			400
	Shreve creek			1,000
	South branch of Timber Coulee creek			1,000
	Spring Valley creek			400

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	BROOK TROUT—Con.			
Westby—Con.	Timber Valley creek			400
	Tvidts spring			1,000
	Von Ruden creek			1,000
	West branch of Kickapoo creek			3,000
Westfield	McGinnis creek			500
West Salem	Barckly creek			1,000
	Gills Coulee creek			200
	Johnson creek			1,000
	Jones creek			200
	Knudson creek			1,000
	Larsons Coulee creek			200
	Luce creek			10,000
	McEldowney creek			200
	Martin creek			1,000
	Osborn creek			1,000
	Ruland creek			200
	Sam McKinley creek			200
	Scotch Coulee creek			200
	Storandt creek			1,000
	Walker creek			1,000
Weston	Dennings springs			1,000
	More creek			1,000
Wheeler	Big Beaver creek			2,000
	Big Otter creek			1,200
	Blanks creek			1,000
	La Forge creek			1,000
	Little Otter creek			1,000
Whitehall	Beaver creek			300
	Bruce Valley creek			800
	Chimney Rock creek			800
	Elk creek			400
	Fly creek			1,100
	Hay creek			200
	Irvine creek			800
	North branch of Elk creek			400
	North creek			300
	North Valley creek			600
	Pigeon creek			2,200
	Rue creek			600
	Rumpel creek			200
	Russel creek			300
	York creek			300
Wilton	Beecner creek			1,000
	Cold springs creek			1,000
	Dorset creek			1,000
	Miller creek			1,000
Withee	Woody creek			1,000
Total		225,000		445,800
	PIKE			
La Crosse	Mississipppi river			8,000

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	CRAPPIE AND STRAWBERRY BASS			
La Crosse	Mississippi river			8,000
	ROCK BASS			
La Crosse	Mississippi river			3,000
	SMALL-MOUTH BLACK BASS			
Elchoe	Bass lake			200
Elkhart	Elkhart lake			115
Fifield	South Fork of Flambeau creek			200
Vilas County	Palmer lake			300
Total				815
	LARGE MOUTH BLACK BASS			
Amherst Junction	Lake Emily			520
Campbellsport	Forest lake			300
Centuria	Balsam lake			300
Cumberland	Beaer dam and Sand lakes			400
Elchoe	Enterprise lake			500
Glenbeulah	Crystal lake			500
Gordon	Bass lake			300
	Blue Gill lake			300
	Clear lake			300
	Leader lake			300
	Wagner lake			300
Grand Rapids	Consolidated pond			700
Hayward	Lake Court O'Reilles			300
Grantsburg	Deep lake			300
Independence	Independence mill pond			500
Iron County	Pine lake			300
La Crosse	Mississippi river			5,000
Lake Nebagamon	Lake Nebagamon			300
Minocqua	Trout lake			8,500
Neshkoro	Neshkoro mill pond			500
Prentice	Worcester lake			205
Rhinelander	Ebey lake			300
	Lirenen lake			300
	Pine lake			300
	Spider lake			300
Richfield	Bark lake			300
	Amy Belle lake			300
Sobieski	Bass lake			600
Sparta	Bushnell's pond			600
	Perch lake			600
Sturgeon Bay	Sturgeon Bay			4,000
Superior	Bass lake			300
Total				28,595

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	BREAM OR SUNFISH			
La Crosse	Mississippi river			5,000
	PIKE PERCH			
Merrillan	Oakwood lake		500,000	
Sussex	Lake Keesus		500,000	
Withee	Hopper river		600,000	
Total			1,600,000	
	YELLOW PERCH.			
Glenbeulah	Crystal lake			120
La Crosse	Mississippi river			2,000
Total				2,120

GRAND TOTALS.

Eggs	39,765,000
Fry	4,320,000
Fingerlings, yearlings and adults	1,130,990
Grand totals	45,215,990

Distribution of Fish.

DISTRIBUTION OF FISH AND EGGS FOR WISCONSIN WATERS BY THE BUREAU OF FISHERIES DURING FISCAL YEAR ENDING JUNE 30, 1908—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	CATFISH			
Beaver Dam	Beaver Dam lake			450
Genoa	Mississippi river			7,500
La Crosse	Mississippi river			16,100
Manawa	Union mill pond			600
New Lisbon	Lemonweir river			450
Prairie du Chien	Mississippi river			30,000
Total				55,100
	BUFFALO FISH			
Genoa	Mississippi river			8,500
La Crosse	Mississippi river			5,250
Total				13,750
	WHITEFISH			
Aminicon River	Lake Superior		2,400,000	
Oshkosh	Wisconsin Fish Commission	15,000,000		
	STEELHEAD TROUT			
Lampson	Steelhead lake			17,000
Woodruff	Wisconsin Fish Commission	50,000		
	RAINBOW TROUT			
Arcadia	Waumandee river			20,000
Bloomer	Duncan creek			10,000
Kendall	Lumsden creek			2,000
Madison	Wisconsin Fish Commission	100,000		
Menomonie	Hay river			15,000
	Lambs creek			10,000
	Wilson creek			15,000
Merrillan	Arnold creek			8,000
Mosinee	Branch of Wisconsin river			4,000
Plymouth	Onion river			4,000
Soperton	Otter creek			4,000
Thorp	Carpenter creek			2,000
	Goggle Eye creek			4,000
Tomahawk	Wind Pudding lake			4,000
Trempealeau Co.	Fox creek			10,000
	Tamarack creek			24,000
Wheeler	Sink creek			2,000
Total		100,000		146,000

RELIEVING THE SEINE OF 55,000 POUNDS CARP, MISSISSIPPI RIVER, BAY CITY, WIS.

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	LAKE TROUT			
Iron River	Lake Superior			160,000
Sand Island	Lake Superior			160,000
Total				320,000
	BROOK TROUT			
Arcadia	American Valley creek			1,800
	Bennings creek			1,500
	Bishop creek			1,800
	Chimney Rock creek			1,800
	French creek			1,500
	Gilman creek			1,800
	Haines creek			1,200
	Holcomb Coulee creek			1,800
	Hunters creek			1,800
	Koenig creek			1,200
	Kreid Valley creek			1,800
	Lewis Valley creek			1,500
	Long creek			1,800
	Mineral Spring brook			1,500
	Montana creek			2,500
	Riley creek			1,800
	Rocky run			1,800
	Sandy creek			1,500
	Scharlow Valley creek			1,200
	Trout run			1,800
Augusta	Thompson Valley creek			1,500
	Travis creek			1,800
Bangor	Holbergs creek			1,200
	Sand creek			1,500
Birchwood	Elizabeth creek		8,000	
	Long Lake stream		10,000	
	Sucker creek		15,000	
	Trout creek		10,000	
	Wilson creek		5,000	
Blair	Bear creek			1,200
	Strum creek			1,200
	Tennison creek			1,500
	Bosse Coulee creek			1,500
Bloomer	Conroy creek			1,200
	Gunn creek			1,200
	McCanns creek			1,800
Bright	Delay creek			1,200
	Stoney creek			1,200
Chippewa Falls	Duncan creek			6,000
Colfax	Eighteen Mile creek			2,500
	Otter creek			1,500
Coxie	Owen creek			1,200
Deer Brook	Eau Claire river			1,200
Eleva	Big creek			1,800
	Trout creek			1,200
Elroy	Tripps creek			1,800

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	BROOK TROUT—Con.			
Galesville	Beaver creek and Tribs.			3,000
	Bion creek			1,200
	Cooleys creek			1,200
	Corrigan creek			1,200
	Dutch creek			1,200
	Grant's creek			1,500
	Hardy creek			1,500
	Moose creek			1,200
	North Beaver creek			1,800
	Silver creek			1,200
	South Beaver creek			3,000
Glenndale	Billings creek			3,000
Gordon	Mishe Mokwa Fishing Club	50,000		
Grand Rapids	Seven Mile creek			4,900
Greenwood	Black creek			1,500
	Norwegian creek			1,500
	Rocky river			1,800
Independence	Ammundson creek			1,200
	Borst Valley creek			1,800
	Chimney Rock creek			1,800
	Koenig creek			1,200
	Travis Valley creek			1,500
	Wickham Valley creek			1,200
	Zimmers creek			1,200
Iron River	Branch Iron river		8,000	
	Iron river		15,000	
	Trib. Iron river		8,000	
Kendall	Davis creek			1,200
	Fox creek			1,200
La Crosse	Oehlers spring			1,200
	Timber Coulee creek			3,800
Lampson	Trout lake		8,000	
Laona	Rat river			3,000
Mauston	Brewers creek			1,800
Menomonie	Anderson creek			1,200
	Annis creek			1,200
	Asylum creek			1,200
	Austin creek			1,200
	Ballard creek			1,200
	Big Hay creek			1,500
	Big Missouri creek			1,800
	Bolan creek			1,800
	Boland creek			1,200
	Clarks creek			1,200
	Coon creek			1,200
	Cowan creek			1,200
	Elk creek			2,500
	Gilbert creek			2,500
	Grult creek			1,800
	Hay creek			1,400
	Iron creek			1,200
	Irving creek			1,800
	Knights creek			1,800
	Little Elk creek			1,500
	Little Missouri creek			1,500
	Little Otter creek			1,500
	Louis creek			1,200

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	BROOK TROUT—Con.			
Menomonie—Con. ..	Lower Price creek			1,800
	McCarthys creek			1,200
	Mud creek			1,800
	Otter creek			1,800
	Pine creek			1,800
	Popple creek			1,500
	Rock creek			1,800
	Rush creek			1,200
	Sand creek			1,800
	Shafer creek			1,200
	Simonson creek			1,200
	Sinking creek			1,500
	Smith creek			1,200
	South Fork creek			1,200
	Spring creek			1,200
	Stoner creek			1,200
	Thum creek			1,500
	Tiffany creek			1,500
	Torgerson creek			1,200
	Wilcox creek			1,200
	Wolf's creek			1,200
Merrill	Branch Pine river			1,200
	Prairie river			3,000
Millston	Mattchett creek			1,200
	Zarte Creek pond			2,500
Mondovi	Big creek			1,800
	Brown creek			1,200
	Carroll creek			1,500
	Elk creek			1,800
	Ford creek			1,500
	Franz Way creek			1,500
	Rosman creek			1,800
Manitowoc	Spring creek			1,500
Rice Lake	Auger creek			3,000
	Barker creek			3,600
	Big Bear creek			3,600
	Big Kettle creek			3,000
	Browns creek			3,000
	Butternut creek			3,000
	Cannon creek			3,000
	Cobb creek			3,600
	Cranberry creek			6,600
	Deitz creek			3,000
	Desair creek			3,600
	Devils creek			3,000
	East Branch creek			3,000
	German creek			3,600
	Hay river			3,000
	Hemlock creek			3,000
	Heyer creek			3,600
	Hickey creek			3,600
	Little Bear creek			3,000
	Little Fall creek			3,600
	Little Savage creek			3,000
	Little Spring creek			3,000
	Little Tuscobie creek			3,600

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	BROOK TROUT—Con.			
Rice Lake—Con.....	Lost creek	.....	.....	3,000
	Meadow creek	.....	.....	3,000
	Miller creek	.....	.....	3,000
	Moosier creek	.....	.....	3,000
	Mud creek	.....	.....	3,000
	Olsen creek	.....	.....	3,000
	Overby creek	.....	.....	3,000
	Pekegamo creek	.....	.....	6,000
	Pigeon creek	.....	.....	3,600
	Pine creek	.....	.....	3,600
	Prairie creek	.....	.....	3,000
	Renville creek	.....	.....	3,600
	Rice creek	.....	.....	3,000
	Rock creek	.....	.....	3,000
	Savage creek	.....	.....	3,000
	Silver creek	.....	.....	3,600
	Sletlons creek	.....	.....	3,000
	South creek	.....	.....	3,000
	Spoon creek	.....	.....	3,000
	Spring creek	.....	.....	3,600
	Spurnine creek	.....	.....	3,600
	Sucker creek	.....	.....	3,600
	Tuscobia creek	.....	.....	3,600
	Weiss creek	.....	.....	3,600
	West Branch creek	.....	.....	3,600
River Falls	Yellow river	.....	.....	3,000
	Kinnickinnic river	.....	.....	2,500
Soperton	South Fork creek	.....	.....	1,200
Sparta	Oconto river	.....	.....	3,000
	Big creek	.....	.....	2,400
	Soper creek	.....	.....	2,400
	Walworth creek	.....	.....	2,460
Stevens Point	Springville creek	.....	.....	2,100
Strum	Lyons creek	.....	.....	1,200
	Spring creek	.....	.....	1,200
Tomah	Cold creek	.....	.....	1,800
	Council creek	.....	.....	1,200
	Deer creek	.....	.....	1,500
	Silver creek	.....	.....	3,000
	Sparta creek	.....	.....	1,800
Viroqua	Johnson creek	.....	.....	1,200
	Rarrison branch	.....	.....	1,500
Waupaca	Waupaca River	.....	.....	6,000
Wauloma	Soule creek	.....	.....	1,200
Westby	Branch Coon creek	.....	.....	1,200
	Branch Timber Coulee creek ..	.....	.....	1,200
	Branch West Kickapoo creek..	.....	.....	1,200
	Eyster creek	.....	.....	1,500
	Freeming creek	.....	.....	1,800
	Gillette branch	.....	.....	1,200
	Kallock creek	.....	.....	1,500
	Knapp creek	.....	.....	1,200
	Miner creek	.....	.....	1,200
	Norbo creek	.....	.....	1,200
	North Branch Coon creek.....	.....	.....	2,500
	Otter creek	.....	.....	1,800
	Rogstad creek	.....	.....	1,200

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	BROOK TROUT—Con.			
Westby—Con.	Seas branch			2,700
	Sherve creek			1,200
	South Branch Bad Ax creek			3,000
	Spring Coulee creek			1,200
	Spring Valley creek			1,500
	Van Ruden creek			1,200
	West Kickapoo creek			1,200
Wheeler	Blank creek			1,200
	Laforge creek			1,200
Whitehall	Barlow Valley creek			1,200
	Beaver creek			1,500
	Bruce Valley creek			1,200
	Crystal creek			1,500
	Fly creek			1,500
	Hay creek			1,500
	Irvine creek			1,200
	North Branch Elk creek			1,500
	North Valley creek			1,200
	Pigeon creek			2,500
	South Branch Elk creek			1,500
Wilton	Dorset creek			1,200
	Hibbard's creek			1,200
	Posey creek			1,200
	Slaten creek			1,200
	Waege creek			1,200
Withee	Missling creek			1,200
Total		50,000	87,000	466,300
	GRAYLING.			
Bayfield	Wis. Fish Com.	50,000		
	PIKE			
Genoa	Mississippi river			750
La Crosse	Mississippi river			2,050
Total				2,800
	CRAPPIE AND STRAWBERRY BASS			
Genoa	Mississippi river			7,500
La Crosse	Mississippi river			10,700
Prairie du Chien	Mississippi river			11,000
Total				29,200
	ROCK BASS			
La Crosse	Mississippi river			100

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	SMALL-MOUTH BLACK BASS			
Armstrong Creek...	Lake Lama	.....	.....	125
Cable	Buffalo lake	.....	3,000	.....
	Prairie lake	.....	2,000	.....
	Prices lake	.....	2,000	.....
Elcho	Lake Nine	.....	.....	250
Grandview	Diamond lake	.....	.....	200
	Hoosier lake	.....	2,000	.....
Hayward	Spider lake	.....	2,000	.....
Nye	Lake Nokomis	.....	2,000	.....
	Mirror lake	.....	3,000	.....
Tuttle Lake	Silver lake	.....	2,000	.....
Total	.....	.....	18,000	575
	LARGE-MOUTH BLACK BASS			
Athelstane	Elbow lake	.....	.....	575
Barron	Manitou lake	.....	.....	200
Birchwood	Birch and Big Chetac lakes...	.....	.....	450
Chetek	Lake Chetek	.....	.....	200
Colegate	Lake Five	.....	.....	200
Cumberland	Beaver Dam lake	.....	.....	150
	Vermillion lake	.....	.....	150
Dunbar	Moon lake	.....	.....	725
Eagle	Eagle Springs lake	.....	.....	250
	Lake Lula	.....	.....	250
Eau Claire	Badger lake	.....	.....	250
Fond du Lac	Lake De Neveu	.....	.....	400
Iron County	Bass Lake	.....	.....	200
	Island lake	.....	.....	250
	Noose lake	.....	.....	200
La Crosse	Mississippi river	.....	.....	2,050
Lampson	Silver lake	.....	.....	150
Melvina	Hunt pond	.....	.....	100
Menomonie	Schmitz lake	.....	.....	200
Merrillan	Electric pond	.....	.....	200
	Halls creek	.....	.....	200
	Trows pond	.....	.....	200
Mikana	Balsam lake	.....	.....	300
North Lake	North lake	.....	.....	200
Princeton	Cox river	.....	.....	300
Richfield	Evergreen spring	.....	.....	550
	Lillycrab lake	.....	.....	350
Shell Lake	Shell lake	.....	.....	150
Sobieski	Bass lake	.....	.....	200
Solon Springs	St. Croix lake	.....	.....	150
Sparta	Lower La Crosse river	.....	.....	200
	Perch lake	.....	.....	200
	Walworth pond	.....	.....	200
Sturgeon Bay	Sturgeon bay	.....	.....	500
Tomahawk	Osage lake	.....	.....	300
	Smith lake	.....	.....	400

Distribution of Fish.

PLANTS MADE BY U. S. BUREAU OF FISHERIES—Continued.

Locality.	Disposition.	Eggs.	Fry.	Fingerlings, yearlings and adults.
	LARGE-MOUTH BLACK BASS—Con.			
Trevor	Rock lake			200
Turtle Lake	Horse Shoe lake			200
Waupaca	Chain of lakes			200
Total				12,150
	BREAM or SUNFISH			
Genoa	Mississippi river			6,000
La Crosse	Mississippi river			15,450
Prairie du Chien	Mississippi river			8,000
Total				19,450
	PIKE PERCH.			
Birchwood	Elizabeth lake		210,000	
	Matson lake		210,000	
Brillion	Long lake		400,000	
Cameron	Prairie lake		400,000	
Grand View	Southwest lake		400,000	
Grantsburg	Bluff lake		200,000	
Iron River	Eagle lake		400,000	
	Upper Pike lake		400,000	
Lampson	Twin lakes		480,000	
Lublin	Diamond lake		400,000	
Narrows	Cedar lake		560,000	
Rice Lake	Rice lake		400,000	
Solon Springs	St. Croix lake		640,000	
Turtle Lake	Echo lake		400,000	
Total			5,500,000	
	YELLOW PERCH			
Genoa	Mississippi river			2,500
La Crosse	Mississippi river			1,400
Prairie du Chien	Mississippi river			3,000
Total				6,900

GRAND TOTALS.

Eggs	15,250,000
Fry	8,005,000
Fingerlings, yearlings and adults	1,089,325
Grand total	24,344,325

THE TULLIBEE (*Argyrosomus Tullibee* Richardson) AS A FISH OF ECONOMIC IMPORTANCE.

GEORGE WAGNER,

Wisconsin Geological and Natural History Survey.

For several years the Geological and Natural History Survey of Wisconsin has been engaged in a study of the fishes of the state. Perhaps the chief result of this study so far has been the recognition of the very general distribution of whitefishes of the genera *Coregonus* and *Argyrosomus* through the lakes of the state. The degree of variation among the forms found has proved to be very great, and much more collecting will be necessary before a complete report can be made. It is the intention here to discuss one species, certain peculiarities of its distribution, and their relation to the economic importance of the form.

The Tullibee, or Mongrel Whitefish (*Argyrosomus tullibee* Richardson) is a form chiefly known from Western British America, although recorded from as far east as Lake Onondaga, New York. Occasional specimens have also been taken in all of the Great Lakes. As far as we know, this is the first notice of its occurrence in Wisconsin, or in any waters of the Mississippi drainage basin. So far we have found the form in three lakes of Wisconsin, which differ rather widely from one another in their physical characteristics. It is now well understood that the critical period for a lake, as far as its living organisms are concerned, occurs in August, at the full establishment of the

The Tullibee as a Fish of Economic Importance.

thermocline. The conditions in these lakes at that time have been well studied by Professor Birge and Mr. Juday of this Survey.

The lakes concerned are Kawaquesaga, at Minocqua in Oneida County; North Twin Lake at Hackley; and Long Lake, about four miles east of Hackley. Both of these last are in Vilas County, and all three drain into the Wisconsin River, although by very different routes.

The portion of Kawaquesaga where we took our specimens has been characterized in a recent paper (Trans. Wisconsin Academy of Sciences, Arts, and Letters. Vol. 16; p. 18). It is 12 to 18 meters in depth, of rather irregular outline, and an area of about 2.5 square kilometers. Its surface temperature in August is about 20° C., while the bottom temperature is about 8° C. Below the thermocline the oxygen becomes less until at a depth of about 10 or 11 meters it disappears entirely. It was only to corroborate a natural supposition that we fished below this depth and caught nothing. But when we set our nets at 8 to 10 meters, where oxygen still occurs, only in about one-tenth the amount found at the top, we caught tullibee in abundance and of a weight up to three pounds. From here it ranges upwards to within 3 or 4 meters of the surface; at the surface itself it does not seem to appear.

North Twin Lake at Hackley, Vilas County, is of about the same depth as Kawaquesaga, but its area is much larger and more fully exposed to the wind. Hence while the surface temperature is about the same as in Kawaquesaga, the temperature at the bottom is higher, or about 11° C. The decrease in oxygen is not quite so rapid either, and there is some left even at the bottom, or ½ m. above it, although only somewhat less than 1% of what there is at the top. Yet here it is in the lowest meter of water that we caught tullibee abundantly, and more were taken in shallow water.

Long Lake (T. 41, 42, N.; R. xi, xii, E.; Forest Co.) is of a different character from either of these lakes. It is long and narrow, curved enough so that the effect of the wind is at least partially checked, and of great depth, especially for its width;

The Tullibee as a Fish of Economic Importance.

26.5 meters were found near the northern third of its length. (It is to be noted that this is *not* one of the two lakes of the same name, referred to in Marsh's Table of Lakes. Wis. Geol. and Nat. Hist. Survey, Bulletin No. XII; p. 88). It is fed in largest part by springs and its narrowness from east to west and its forested shores protect it somewhat from the warming effect of the sun; hence vegetation in it is rather scant, except at the lower end, which is shallow. Consequently the usual cause for the consumption of oxygen at the bottom is largely absent, and one-half as much oxygen occurs here as at the top. The bottom temperature is low, only about 4° or 5° C., while the top is 19° C. Here again we caught tullibee in great numbers at the maximum depth, and none above, even after repeated efforts.

We have here then a species of whitefish, large enough and of good enough quality as food to be worthy of economic consideration, that seems to be able to adjust itself to quite various conditions of environment. Certainly its adaptability is very much greater than that of *Coregonus labradoricus,* which, so far as our experience goes, occurs only in the deep waters (in summer) of lakes approximating Long Lake in their physical characters. Of course, there is a limit to the adaptability of the tullibee, as is shown by its restriction to certain depths in both Long Lake and North Twin Lake.

Nevertheless, the species seems to be a very promising form for introduction into certain large shallow lakes. In Lake Pepin on the Mississippi, Lake Winnebago, and some others, we have lakes that are comparatively shallow, and so large that their utilization for commercial fisheries, as well as for sport, is not only possible, but highly desirable. Lake Pepin is now being so utilized to a very large extent. But it yields only the coarser fish, such as buffalo, carp, and to a certain extent, spoonbills. The successful introduction of a whitefish into this lake, and a proper regulation of its capture, would prove a great and lasting benefit. Whitefish (*Coregonus clupeiformis* Mitchell) have indeed been planted in it, but with no success, the genus *Coregonus* being seemingly not adaptable to such waters. But it seems to us highly probable that with so adaptable a form as

The Tullibee as a Fish of Economic Importance.

the tullibee, and with heavy and perserving planting through four or five years, success could be attained. And there are other lakes in Wisconsin, and probably elsewhere, where it could be introduced and its fishing permitted under certain restrictions, without any detriment whatever to the game fishes.

EXPERIMENTS IN REARING SMALL-MOUTH BLACK BASS.

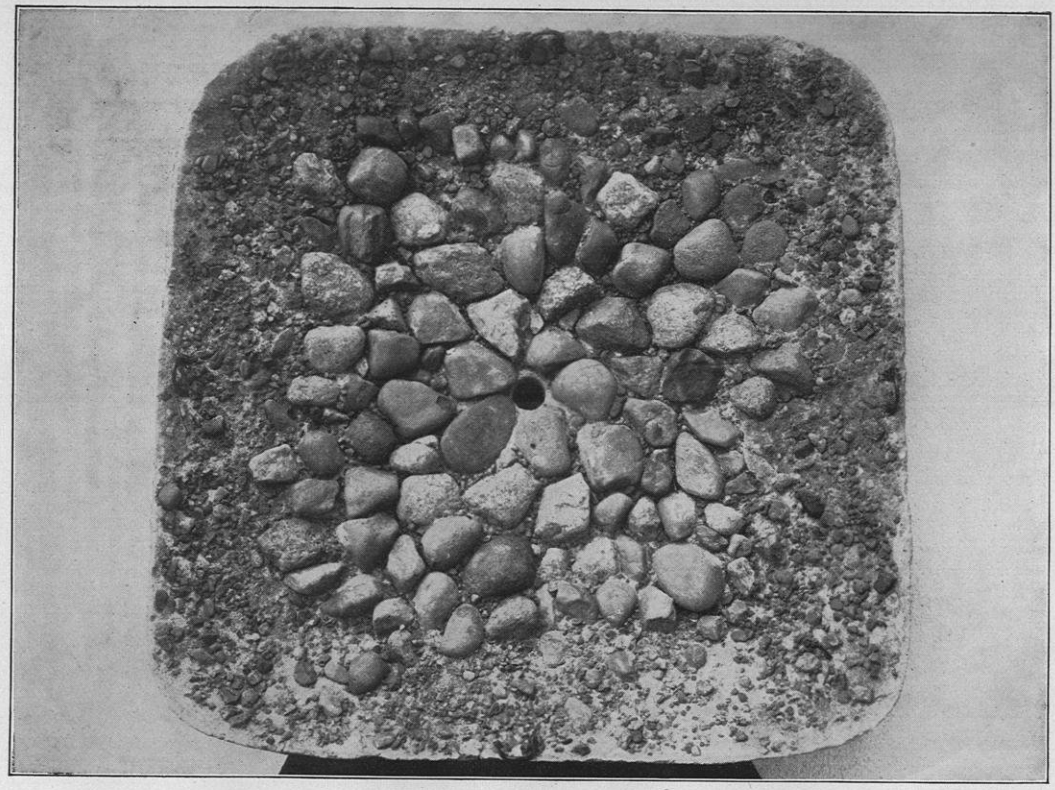
ROBERT RIFFLE.

Minocqua Hatchery.

The following paper records some experiments made at the Minocqua Hatchery, Wisconsin, with artificial nests for rearing small-mouthed black bass. These nests are made of Portland cement, mixed one part cement, two parts sand, moulded in a box 24 inches square, with rounded corners. They are about 3 inches thick at the edge and 1 inch thick in the center, where there is a hole 1 inch in diameter. They weigh about 50 lbs. each. The surface is covered with gravel and stones, and sprinkled with sand. About 15–18 stones of various shapes and the size of a hen's egg are set near the center; outside of these come smaller stones, diminishing to fine gravel at the edge. Great care is exercised in setting the stones, so that the nest will appear natural and so that the nest will drain as well as possible to the central hole. When in use the hole is blocked by a small stone, which prevents loss of eggs in the hole and also makes the nest more acceptable to the fish. A loop of strong copper wire is embedded in each side of the nest, by which it can be easily handled.

The purpose of these nests is two-fold: 1. To render possible some experiments in hatching eggs on trays after removing from the nests. 2. To furnish better conditions for hatching than are given by the nests made by the fish themselves.

I will speak of the second point first. It is well known that no better conditions for hatching the fry can be supplied than



RIPPLE'S ARTIFICIAL BASS NEST.

Experiments in Rearing Small-mouth Black Bass.

are offered by a natural nest of the best type, on which the eggs are properly spread by the female and which is properly guarded and fanned by the male. But such conditions are by no means always met. The stones in the center of the nest may be too large, leaving deep and narrow crevices; and whether they are large or small the spaces may be such that the eggs which fall into them cannot be properly fanned. Such eggs are almost certain to die and to be attacked by fungus. This condition is aggravated when, as often happens, the female does not properly scatter her eggs but drops them in masses. In such case those eggs which fall between the stones are certain to become fungused. Many failures of nests to develop fry, attributed to lack of fertilization, are really due to causes of the kind here indicated. The evils caused by imperfect circulation of the water are by no means ended when the eggs are hatched. Many of the young fry fall between the stones and are smothered or attacked by fungus.

These evils have caused annually the loss of many eggs and fry at the Minocqua Hatchery and I was, therefore, led to experiment with the artificial nests described. Some 50 nests were made last winter and were put to use this season. They were placed in the ponds so as to be sheltered by a stump or log and were sheltered by a two-sided frame of ½ inch boards, placed near the nest. The males hesitated at first to accept them but soon did so and altogether some 75 pairs of bass used them in ponds where there were plenty of the old style box, loose gravel nests. In many cases they preferred the new nests; a good many being used more than once. Many of our breeding bass come from lakes where they are accustomed to spawn on bars covered by large stones. Such fish will hunt for spawning beds like those to which they are accustomed; but if they are put into ponds with only sand or fine gravel on the bottom, they will come to the artificial nests and be content with them. They will also hatch out and raise a larger percentage of fry on the artificial nests than on one constructed by the fish out of large stones. Even though only smaller stones are given them, the circulation of water is better in the artificial nest than under

Experiments in Rearing Small-mouth Black Bass.

natural conditions and the results are correspondingly better. Altogether some 15 nests were hatched successfully under natural conditions on these cement nests and the results were such as to convince me that it would be well to provide them in all cases.

The immediate purpose of making the cement nests was, however, not so much to furnish the bass with better nests than he could build, but to make possible experiments on removing the eggs and hatching them on trays. When the eggs are first laid they adhere rather firmly to the stones, but after the third day they can easily be detached. The nest is taken from the pond to the hatching house and placed on a tub or similar vessel in the fry-trough. The water is allowed to rise in the trough until it fills the tub, and, rising through the hole in the center of the nest, fills it to the edge, or, at least, so as to cover the eggs. The eggs are then loosened with a feather, working them toward the center; the nest is then raised and lowered a few times and the eggs flow with the water through the hole in the nest into the tube. The whole operation may take a half hour on the first day; two or three days later it would occupy perhaps ten minutes. If the nest has been made with the proper drain and dish, the eggs are removed quickly without loss or injury.

They are then placed in trays, which are put into an ordinary hatching trough. Only three trays are placed in each compartment, so that the eggs may have abundance of water; each tray carries about 3,000 eggs. The temperature of the water is 55°–57° F.

After hatching, the fry remain on the trays until they are ready to feed—about 10–12 days. They are then transferred to screens in the ponds to feed themselves until they are distributed. About 50,000 fry were raised in this way during the present season with very little loss.

I do not recommend that all eggs be taken from the nests and hatched in this way. The conditions offered by artificial hatching are as good, but not better than the best natural conditions. But every breeder of bass knows that there are many nests in his ponds, where a large part, or all, of the eggs and fry become

fungused from the causes indicated in this paper. If such nests are on natural bottom nothing can be done to save the eggs, since they cannot be removed from loose stones, gravel, and sand. But if all the fish spawn on these cement nests, those may be left in the care of the male which are in good condition and are properly cared for, and the others can be saved by removing the eggs. These are not unlikely to be the nests containing the largest number of eggs, and there will probably be a considerable number of nests, so that the gain will be well worth the cost in time and trouble. Many smaller losses of eggs are also avoided by the use of these nests, since in the natural nests it almost always happens that some eggs or fry are deposited where they are not in the currents of water, and die in consequence. Some nests are also deserted by the male fish and are left without the natural protector.

It is intended next season to furnish these nests for all the small-mouthed black bass in our ponds. A further report will be made if any new or interesting facts develop.

PUBLIC LIBRARY BUILDING, MADISON.

SEVENTH BIENNIAL REPORT

OF THE

FREE LIBRARY COMMISSION

OF WISCONSIN

1907–1908

Published by Authority of Law

MADISON
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1908

Wisconsin Free Library Commission

Ex-officio:

C. R. VAN HISE, *President of the University of Wisconsin,* Madison.

CHARLES P. CARY, *State Superintendent,* Madison.

REUBEN GOLD THWAITES, *Secretary State Historical Society,* Madison.

Appointed by the Governor:

JAMES M. PERELES, Milwaukee.

MRS. CHARLES S. MORRIS, Berlin.

Officers:

JAMES M. PERELES, *Chairman.*

REUBEN GOLD THWAITES, *Vice-Chairman.*

HENRY E. LEGLER, *Secretary.*

Letter of Transmittal

MADISON, July 1, 1908.

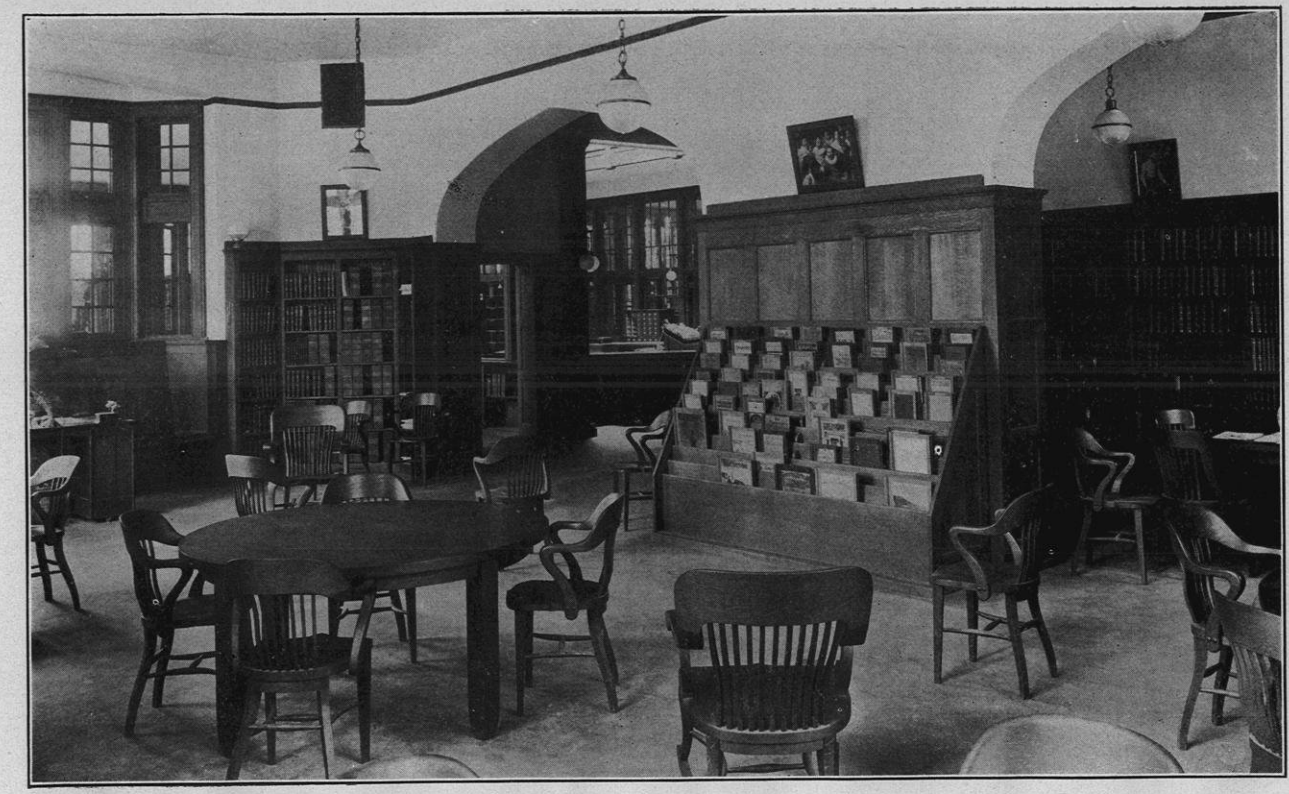
To Hon. JAMES O. DAVIDSON, *Governor:*

SIR:—I have the honor to transmit, herewith, the seventh biennial report (1907–8) of the Wisconsin Free Library Commission, in accordance with the provisions of section 383a, of the Wisconsin Statutes of 1898.

Very respectfully,

JAMES M. PERELES,

Chairman.



READING ROOM—PUBLIC LIBRARY, MADISON.

WISCONSIN FREE LIBRARY COMMISSION

I.

SECRETARY'S REPORT

Free public libraries	156
Library buildings	66
Libraries in city halls	36
Total annual tax levy for support of public libraries	$225,000
No. of volumes in public libraries	775,447
No. of volumes in school libraries	1,250,000
No. of volumes in other libraries maintained by the state	500,000
No. of volumes in state traveling libraries	24,794
Librarians and assistants who have had professional training	88
Gifts from citizens for library buildings, to date	$492,000
Carnegie gifts to date	$807,500
City appropriations for library buildings	$565,000

Summarizing the statistics of public libraries for the last biennium, the figures show that there are at this date 156 free public libraries in Wisconsin, as compared with 126 four years ago, 105 eight years ago, 52 twelve years ago, and 28 fifteen years ago.

This array of bare figures does not tell the entire story of growth, nor does it indicate the rapid rate of progress as to efficiency. It does, however, measure the spread of library facilities to all sections of the state, and in most localities, where the density of population makes possible the maintenance of free public libraries. There now remains no city of 3,000 population unprovided, and but five which count in excess of 2,000 inhabitants have thus far failed to establish public libraries. These are: Cudahy, 2,556 population; Tomahawk, 2,626; Phillips, 2,011; River Falls, 2,300; Hurley, 2,000.

One or more public libraries may be found in every county of the state, with the exception of the following ten: Adams, Burnett, Calumet, Iron, Forest, Florence, Marquette, Polk, Vilas and Waushara.

On the other hand, there are many hamlets and villages approximating 600 to 1,500 population each, which are bravely seeking to furnish library privileges by public taxation. These communities the Wisconsin Library Commission is seeking to aid by means of its Town Libraries, an enlargement of the rural traveling library system which has yielded splendid results during the brief period of operation. If this plan, which is described in another part of this report, could be still further extended and developed, it would mean much for the promotion of library work in the state. Small and struggling libraries would thereby be assured the use annually of from 400 to 600 well-selected and up-to-date books at nominal cost, instead of tying up their meager book funds in a mere handful of volumes that would be little used after a limited period.

An Era of Library Building

The close of this biennial period brings to a close as well the period of library building in Wisconsin. During the past six years especially, there has been much activity in providing structures for housing public and college libraries under their own roofs. Sixty-six public libraries are now in buildings constructed especially for them. The sum of $1,299,500 represents individual gifts for library buildings in this state, $492,000 of this princely sum having been contributed by citizens of the respective communities where such memorial libraries have been erected. Andrew Carnegie has given Wisconsin libraries $807,500 for buildings.

The library buildings that have resulted from gifts or bequests of Wisconsin citizens are the following:

Beaver Dam, $25,000 from J. J. Williams.
Delavan, $15,000 from the Aram estate.
Evansville, $10,000 from A. Eager.
Janesville, $10,000 from Eldred estate, in addition to a Carnegie gift.
Kenosha, $150,000 from Z. G. Simmons.
La Crosse, $17,500 from C. C. Washburn, and $25,000 from five citizens, whose names are not made public.
Lake Geneva, $7,000 from Mrs. Geo. Sturges.
Lake Mills, $8,000 from L. D. Fargo.
Marinette, $30,000 from Isaac Stephenson.
Menasha, $20,000 from E. D. Smith.
Menomonie, $125,000 from Andrew Tainter.
Monroe, $12,500 from H. E. and W. Ludlow.
Mosinee, $5,000 from Joseph Dessert.

Neenah, $15,000 from citizens, in addition to a Carnegie gift.
Oconomowoc, $4,500 from residents.
Oconto, $15,000 from George Farnsworth.
Oshkosh, $55,000 from Philetus Sawyer and the Harris estate.
Stanley, $15,000 from Mrs. Sally F. Moon.
Two Rivers, $4,000 from citizens.
Waukesha, $3,000 in addition to a Carnegie gift.
Waupun, $1,000 from the Beach estate, in addition to a Carnegie gift.
Wausau, $10,000 from citizens, in addition to a Carnegie gift.
Wausaukee, $4,500 from H. P. Bird.
Wauwatosa, $5,000 from citizens, in addition to a Carnegie gift.
Whitewater, $15,000 from Flavia White.

The following are the Carnegie buildings:

Antigo, Arcadia, Baraboo, Bayfield, Beloit, Berlin, Chippewa Falls, Cumberland, Darlington, Durand, Eau Claire, Edgerton, Elroy, Fond du Lac, Green Bay, Hayward, Hudson, Janesville, Kaukauna, Ladysmith, Madison, Manitowoc, Neenah, Racine, Rhinelander, Rice Lake, Richland Center, Ripon, Sheboygan, Sparta, Stevens Point, Stoughton, Superior, Viroqua, Washburn, Watertown, Waukesha, Waupun, Wausau.

The following libraries are located in city halls:

Abbotsford	Dodgeville	Mondovi	Prairie du Sac
Appleton	Elkhorn	Neillsville	Prescott
Belleville	Fairchild	New London	Reedsburg
Brodhead	Grand Rapids	New Richmond	Seymour
Clintonville	Hartford	North Milwaukee	Shawano
Colby	Independence	Omro	Spring Green
Columbus	Marshfield	Orfordville	Sun Prairie
Delafield	Mazomanie	Portage	West Bend
De Pere	Merrill	Prairie du Chien	Williams Bay

A number of notable college library buildings have been erected within the past few years, among them those at Milwaukee–Downer College, Beloit College, Lawrence College, Oneida Grafton Hall, St. Francis Seminary.

Future Work

Up to this time, the work of the Commission has been largely that of laying foundations. From now on, much of the work must be directed to strengthening and building up what has been begun. The establishment of a library school, two years ago, was in line with this policy. This work must be intensive in seeking to give librarians and trustees a deeper insight into the meaning of library service for a community, the deeper significance of books, the larger meaning of reference work for business and municipal, trade and manufacturing problems, as well as for the ever-present woman's club, and the high school student. It will be extension work as well, in that it will seek to make the library a social center in every community, with branches when feasible, a broad and well-planned co-operation with the schools,

etc. One hundred and fourteen libraries have been established since 1895. That was the period of building; we must look forward now to the period of perfecting, developing, spiritualizing. It will not be so easy to show results in statistical tables, and in records, of such work, but it will show rather in the finer culture of the community life, in individual lives, in character, in a development of living conditions that shall be more worth while in the frontier towns, and in the kind of men and women that enter the University.

Rural and Urban Conditions Contrasted

In the country districts, of course, much remains to be done in merely supplying books for those who live remote from centers of population. The city dwellers are fairly well provided with access to wholesome books. If the statistics compiled by the national government are accurate, the average number of books per each 100 of the population is 58. These figures, like most bare statistical summaries, are apt to be misleading as to general conditions. There is no doubt that 900,000 persons who constitute the urban population, are well-supplied with books. In Milwaukee, for instance, the volumes will average 50 to the 100 population. In Fond du Lac, every man, woman and child resident there could borrow a book, and still leave about 8,000 volumes on the shelves. In La Crosse, when the children's department was installed a couple of years ago, the juvenile population showed such appreciation of the opportunity that every book available was taken out the first week. At Stevens Point, there are 5,799 books, and 4,965 borrowers, the collection of less than 6,000 volumes having a circulation of 68,000 annually. And there are but 10,000 people in that city.

From these few cases cited, it will be seen that conditions differ greatly in the several cities of the state. On the whole, the cities are fairly well provided. In the rural regions, however, the provision is very inadequate. The 36,000 books sent to 600 traveling library stations do not supply the need fully. There are doubtless a million residents who have access to no libraries except those they may have in their own homes, and no doubt in hundreds of homes the possession of books is limited to those used by the children in their classes at school.

There are now in the hundreds of local district school libraries approximately 900,000 volumes. Many of these are in sets of

ten to thirty of each book used, and are not used outside the school buildings. Under the state law, there is annually expended for township libraries, 10 cents for each child between the ages of 4 and 20, about $60,000 per annum being raised by taxation in this manner. None of this money goes to public libraries. For the latter, the sum raised by taxation is determined by each community for itself. The total receipts for current maintenance of public libraries is now about $225,000.

Owing to the limit placed by the law of 1907 upon the number of pages allotted for biennial reports, it is not possible to discuss library conditions and problems more fully here. The files of the WISCONSIN LIBRARY BULLETIN record the work of the Commission in considerable detail, and in lieu of an extended report here reference must be made to that periodical for additional information. The important publications issued by the Commission are also fully described there. The work of the several departments is summarized in the pages which follow. The financial transactions of the Commission are given in extenso in the biennial report of the Secretary of State.

The faithful and effective work of the department chiefs—Miss Stearns, Traveling Library Department; Miss Hazeltine, Instructional Department; and Dr. McCarthy, Legislative Reference Department—and of their respective staffs, merits high praise. Their cordial coöperation and interest have been instrumental in large degree in rendering the work of the period covered by this report valuable to the state and promotive of the interests entrusted to the Commission.

HENRY E. LEGLER,
Secretary.

II.

INSTRUCTIONAL DEPARTMENT

Librarians who are graduates of library schools	12
Assistants who are graduates of library schools	3
Librarians who have attended library summer schools	48
Assistants who have attended library summer schools	25
Graduates of Wisconsin Library School in 1907, 22; in 1908, 19; total	41

By the establishment of the Wisconsin Library School, two years ago, a great impetus has been given to the library movement of the state. As a result there promises to be a decided improvement in the character of the library service, and in administration generally. The following extracts from a comprehensive and very suggestive report submitted by the chief of the department, Miss Mary Emogene Hazeltine, treat of some interesting phases of the work. Necessarily, however, they can give but a fragmentary survey of the field when disassociated from the full report, which embraces the following topics in logical arrangement:

1. School instruction, including long course, short course, supplementary courses, special courses; field practice work, and visits.
2. Institutes.
3. Field visiting.
4. Correspondence.
5. Bulletin and other publications.

Library School

It is not possible for any school, for any institution, to say, "we will establish some traditions," glad as a new school would be to start with well-defined precedents and traditions. These are a matter of growth. But after two years, though it may seem presuming to make the statement, certain standards have become established in connection with the courses of study and their sequence, the field practice period, days and occasions, and other work of the school.

A systematic study was made of the curriculum followed in the first year, and a logical sequence of courses worked out for the second year, and this in turn will be improved upon for the

CHILDREN'S ROOM—PUBLIC LIBRARY, MADISON.

third year. It was felt by the faculty that the schedule of the second year was a great improvement over that of the first, and that it can well be made the basis for the school's programme of lessons, apprentice work, field practice, and special school occasions. In fact, the work as planned for the third year of the school, beginning 29 September 1908, is so thoroughly systematized as to prove that the school is no longer in an experimental stage, but rather on an excellent working basis. This rapid but complete and substantial organization, not only of the curriculum, but of the individual courses, is due to the devotion, ability, and sheer hard work of the staff, and to them great praise is due. The hearty coöperation of the students, and their willingness to meet the hard work of a one year's course should also be counted as one of the elements in the success of the school, and its complete, though rapid organization.

New Courses

The catalogue of the Wisconsin Library School announces a new policy of the school, namely, a joint course with the University of Wisconsin, whereby students, during the Junior and Senior years, after properly qualifying for entrance to the Library School at the end of the Sophomore year, can take the work of the Library School, receiving five credits a semester (twenty credits as a total) toward their A. B. degree. It is further expected to arrange a joint course with the Legislative Reference Department, and the University, whereby students wishing to make a specialty of this branch of library work, which is perhaps more fully developed in Wisconsin than in any other state in the country, can have the benefit of the Political Science Department of the University, the practical training in the Legislative Reference Library, and the technical courses needed as a foundation in all library work, in the Library School. These joint courses make a strong combination, and it is no doubt that they can be planned and carried out successfully.

Field Practice

The field practice work, which is an integral part of the course, is planned to give the students actual library experience during the course of study. During February and March the schedule

is suspended, and the students are placed in the different libraries of the state, where they work under the direct guidance of the librarians, and the oversight of the faculty of the school. The state is so large, and presents so many library problems, that the individual needs of every student can be met. A student entering the school without experience can be sent to a well organized library to serve as a general assistant, and so become familiar with library administration, records, routine, and work with the public in all of its phases; on the other hand a student coming to the school after several years of experience, can be given work in organizing new libraries, or reorganizing old ones, thus having opportunity to do independent work under the general supervision of the faculty, and gaining executive and administrative experience, which is a valuable part of the training. Such experience also is helping to develop commission workers, for whom there is great demand.

This arrangement for field work is not only a great gain for the students, but it is good for library development in the state as well. Students going fresh from the work and interests of the school carry with them, in their residence of a month, even in the well-established libraries, a new element of enthusiasm, a new message of library work, which the librarians regard as very good for the staff. In sending the students to do the regular extension work of the Commission, the library cause is directly advanced, often further than it would be without the aid of the students, as they stay longer in one community than could a staff organizer, so giving greater perfection of organization.

The work is carefully planned every year, according to the needs of the state for that year, and is not stereotyped, thus allowing the greatest development for the state work, and the widest opportunity for the students.

Students of the Library School

Two classes have been graduated from the Wisconsin Library School, twenty-two graduating in the class of 1907, and nineteen in the class of 1908. A summary of the graduates shows that of the forty-one, twenty-four were residents of Wisconsin, four of

Illinois, three each of Iowa and Nebraska, two of Minnesota, and one each of Michigan, Indiana, New York, Montana, and Washington.

The demand for graduates is greater than the supply, which is an encouraging circumstance in the history of a new school. It is most gratifying to know that our students have proved successful in the varied positions which they are filling, and that other libraries, seeing and knowing their work, seek our graduates for positions in their libraries.

A summary of the positions filled by the graduates of the school follows:

Wisconsin, permanent positions—17, including two in the University Library, one in the State Historical, two for positions in the Commission's Instructional department, two assistants in the Racine Public Library, one each in the public libraries of Madison, Eau Claire, Sheboygan, as children's librarians; chief librarians have been supplied for Rhinelander, Delavan, Oconto, Antigo, Mosinee, and Waupun; and a librarian for the Stout Institute, Menomonie.

Wisconsin—temporary work. Between the time of leaving the school, and taking permanent positions, various students have done temporary work in the libraries of the state, for organization, or to tide over vacancies, or to assist for some special work. The Historical library, the public libraries of La Crosse, Mosinee, Racine, Viroqua, Madison, Oconto, the Normal School library of River Falls, the high school libraries of Milwaukee, and the Commission, both in the Legislative Reference and Instructional departments, have had special work done by graduates of the school.

Other states, permanent positions—22. New York, 2—New York City and Buffalo, each one; Pennsylvania, 3—all in Pittsburg; Ohio, 3—2 Cincinnati, 1 National Tax Association, Columbus; Nebraska, 2—Lincoln and Omaha, each one; Iowa, 2—Tipton and Dubuque, each one; Minnesota, 2—University and Commission; Illinois, 2—Chicago and Jacksonville, each one; Missouri, 1; Washington, 2—Supt. of Documents; Alabama, 1; Montana, 1; Michigan, 1.

Other states, temporary work. Students have taken temporary positions in other states, on the same basis as they have in Wisconsin, and have done creditable work in all. In the Minnesota Library Commission, in Kewanee (Ill.) Public Library, in Cheney (Wash.) Normal school, as organizer and others.

Salaries. The lowest salary received, is $30.00 per month at Mosinee; the highest, $1,100 per year, as assistant librarian at Lincoln, Neb. Several are receiving $900 per year, some $840, others $720. The average paid in Wisconsin is $600 per year. We are sorry to record that our own state pays the lowest salaries, but we hope as the value of trained service becomes apparent, that the salaries will be increased.

III

TRAVELING LIBRARIES

1907–8

BOOKS

365 libraries of English books, containing 18,043 books.
136 libraries and 181 groups of books in foreign languages, containing 6,751 books.
Total number of libraries, 501; total number of groups, 181.
Circulation of English books, 72,705 in 1907–8, and 69,361 in 1906–7; total for biennial period, 142,066.
Circulation of books in foreign languages, 26,186 in 1907–8, and 25,067 in 1906–7, a total of 51,253 in two years.
Total circulation, 98,891 in 1907–8, and 94,428 in 1906–7; total for biennial period, 193,319.

STATIONS

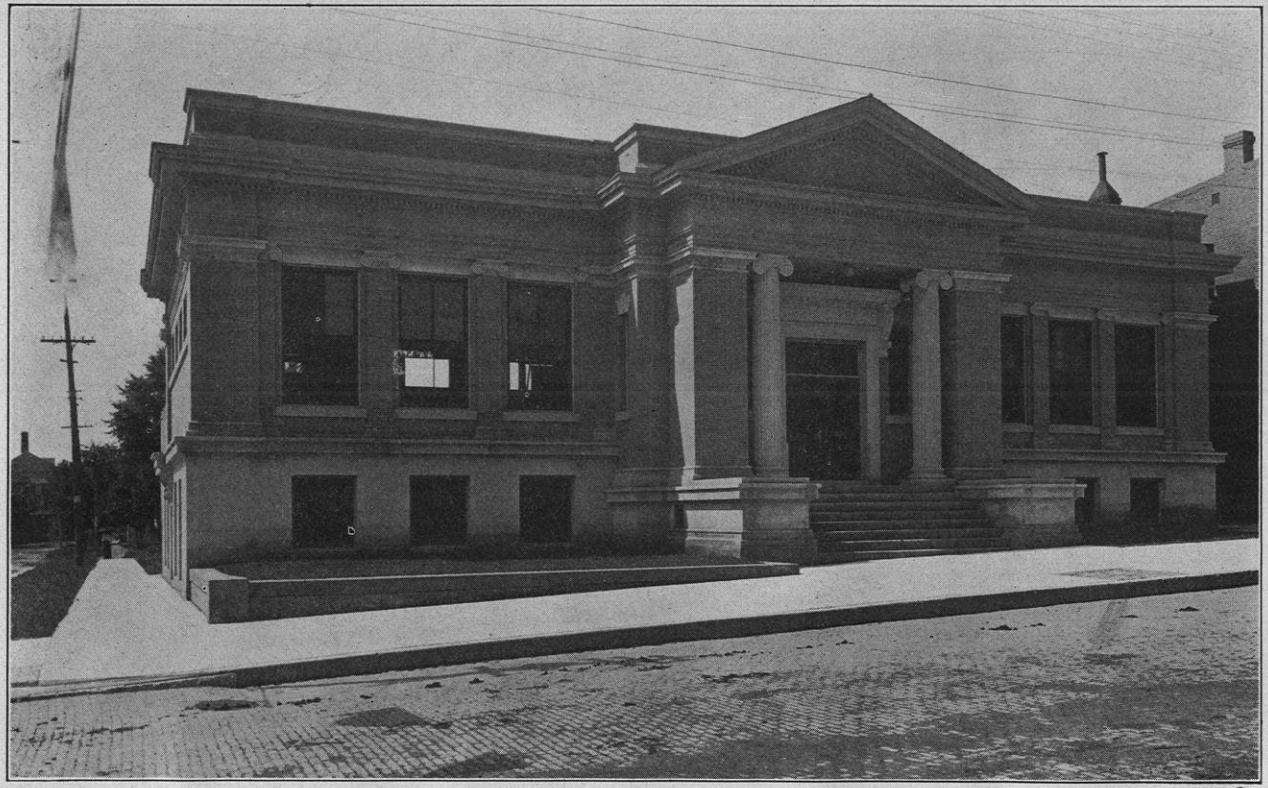
New stations in 1907–8	61
Stations reestablished	13
Stations discontinued	7
Stations supplied with 25-vol. libraries	31
Stations supplied with 50-vol. libraries	180
Stations supplied with 100-vol. libraries	13
Stations in state institutions	2
Stations in public libraries	30
Stations supplied with new-book libraries	13
Stations supplied with fiction libraries	16
Stations supplied with juvenile libraries	10
Stations supplied with study reference libraries	65

FOREIGN-BOOK LIBRARIES

German libraries (35 vols.)	64
German groups (10 vols.)	55
Norwegian-Danish libraries (35 vols.)	25
Norwegian-Danish groups (10 vols.)	36
Polish libraries (35 vols.)	5
Polish groups (10 vols.)	9
Bohemian groups (10 vols.)	6
Foreign-book groups loaned to county systems	42

COUNTY SYSTEMS

Number of libraries	261
Number of stations	226
Circulation 1907–8	43,045



PUBLIC LIBRARY BUILDING, WATERTOWN.

Traveling Libraries

From the accompanying figures may be learned, in statistical summary, the present condition of the state and county library systems. Compared with the last biennial period, there is a substantial growth, both as regards the increase in number of books and increased circulation. A growth not apparent from the statistics, but gratifying to note, is the wider distribution to remote sections of the state heretofore untouched. Notwithstanding, there are hundreds of small places which remain unprovided, and which must be neglected until more books are available than the present limited resources provide.

The sum of $5,000 annually, additional to the standing appropriation, could be utilized to advantage for extending the state system of traveling libraries. At this time every library is out, and there are many communities waiting to take the places of inactive stations, should any desire to discontinue. The number of discontinued stations has greatly decreased in the last year, when there were but seven, as compared with eight times as many during the preceding year. Of those discontinued in 1907, thirteen were reestablished in 1908. The growth in number of stations, compared by biennial periods, is as follows:

	No. stations
1904	190
1906	279
1908	388

These figures are exclusive of 226 stations in counties operating systems of their own.

Circulation

Bare figures of circulation are misleading when applied to traveling library use. Books secured from this source are intended for family rather than for individual use, and an average of three readers for every book drawn from a traveling library by a regular card holder is not an extravagant estimate. The figures limited to actual recorded circulation are, however, in every way encouraging. The total circulation for the last year of books in the state and county systems was 135,321. For the biennial period, the total circulation was more than a quarter million.

Traveling Libraries

Town Libraries

Begun experimentally two years ago, the Town libraries of 100 volumes each, exchanged semi-annually, have proven successful beyond anticipation. The books were chosen with great care; the larger number of them comprising the several series permit better balance than is possible with the traveling collection of standard size, and consequently patrons are given a wider range of choice. The circulation has been so much larger per volume than in the other libraries that the life of the books promises to be much briefer than customary. It is likely that, with reasonable wear and tear, the Town libraries will last not much longer than three years—certainly less than the five years estimated as the duration of their usefulness. One-seventh of the entire circulation total furnished by the English books, is contributed by ten Town libraries.

Despite the fact that there is an annual charge of $12.00 for each of these, while the standard libraries are loaned without fee, it has been impossible to meet the demand. As knowledge concerning these libraries is spreading, the demands are increasing. While all the funds possible have been devoted to the purchase of additional series, without a larger appropriation no considerable development can be effected. This is cause for regret. By means of the Town traveling libraries, many small libraries which have languished for want of books, have been quickened into renewed life. Many a village or small city ambitious to possess a public library, but unable to finance such an institution on a basis predicating usefulness and success, has been enabled through this source to realize its ambitions. The system, if the means are obtainable for expansion and development, will solve the most serious problem of the small library.

Were funds available for first purchase, double-size Town libraries could be furnished fifty or sixty of the smaller public libraries of the state, exchangeable two, or perhaps three, times annually, so as to give to the respective communities at an annual cost of twenty dollars the use of books equivalent to an expenditure of $400 or $500 annually. To provide fifty libraries in this manner, about $9,000 would be required, and approximately one-half this sum would be realized in rental fees. In

some of the Eastern states, a sum considerably in excess of this amount is given from the state treasury every year to aid public libraries in the purchase of books.

Study Reference Libraries

The growing demand from study clubs has been met as fully as the resources of the Commission would allow. In the last three years, the number of study reference libraries has doubled. There is now a total of 65, covering the following subjects:

American Literature (6)
Art—General (from which groups on various schools and subjects are made)
Art—American
Art—Italian Renaissance
Art Poems—Browning, Longfellow, Tennyson
Austria
Canada
Educational Topics
George Eliot
England and Wales (2)—Travel
English History
English Literature—Normans to Stuarts
English Literature—Hanoverian Period
English Literature—Victorian Period
English Literature—The Novel
English Literature—Representative Authors of the Nineteenth Century
France (4)
Germany
Great Britain
Household Economics (2)
Italy—Mediaeval
Italy—Modern
Japan
Marble Faun
Modern Drama
Municipal Affairs
Music (2)
Nature Study
Norway and Sweden
Norway, Sweden and Denmark
Russia
Scotland and Ireland (2)—Travel
Shakespeare (Large collection, from which groups are made)
Spain
Thackeray
United States—Description and Travel (3)
United States—Discovery Period
United States—Colonial Period
United States—Revolutionary Period

United States—Civil War
United States—Civil War to Date
United States—Middle West
Village and Town Improvement
Wisconsin History (8)

The eight libraries on Wisconsin history, furnished by the Wisconsin Historical Society, have been in constant use, and have been popular.

The list of cities and villages where study reference libraries are now located is as follows:

Antigo
Appleton
Ashland
Augusta
Bagley
Black River Falls
Bloomington
Boscobel
Brandon
Brodhead
Campbell
Colby
Columbus
Darien
Dodgeville
Eagle
Earl
Edgerton
Ft. Atkinson
Grand Rapids
Hillsboro
Hixton
Janesville
Jefferson
Ladysmith
Lancaster
La Valle
Manitowoc
Marshfield
Mauston
Merrill
Milton Junction
North Freedom
Omro
Owen
Platteville
Portage
Prairie du Chien
Prairie du Sac
Racine
Randolph
Reedsburg
Rhinelander
Rib Lake
Rice Lake
River Falls
Shawano
South Kaukauna
Sparta
Sun Prairie
Token Creek
Tomah
Waterloo
Watertown
Waukesha
Waupaca
Waupun
Wausau
West Bend
Whitehall
Wyocena

In addition to the fixed groups, many special groups have been made up from time to time to meet special calls.

The Study Club department of the Library Commission has issued a series of study outlines which has met with much favor. Each of these outlines is intended to cover a year's study, but can be very profitably divided to cover a longer period if a club is willing to devote the time to it. The form of the outline has been largely determined by experience with study clubs in the past, and by conferring with club members whenever opportunity offered. The outline is supplemented with a list of books, from which references are made. The books listed embrace the study library supplied by the Commission to the club undertaking the study. To members of such clubs, the outlines in printed form are furnished without charge. The outlines comprise the following topics:

1 Japan
2 Russia
3 Canada
4 Travel in England and Wales
5 Travel in Scotland and Ireland

PUBLIC LIBRARY BUILDING, EAU CLAIRE.

6 French History
7 Modern Italy—History
8 Shakespeare's King John; by Mrs. H. A. Davidson
9 Shakespeare's King Richard Second; by Mrs. H. A. Davidson
10 Shakespeare's King Henry Fourth, Part I.-II.; by Mrs. H. A. Davidson
11 Shakespeare's King Henry Fifth; by Mrs. H. A. Davidson
12 United States History—Discovery and Exploration
13 United States History—Colonial Period
14 United States History—Revolution
15 United States History—Formation Period, 1783–1817
16 United States History—Expansion Period, 1817–1860
17 United States History—Civil War and Reconstruction, 1860–1876
18 United States History—From Reconstruction to Date, 1876—
19 Travel in the United States
20 French Art
21 American Literature
22 English Literature—Early Victorian Period
23 History of Wisconsin, 1634–1909

Open Shelf Collection

To respond to calls from public libraries seeking to supply the needs of special students and of the "occasional reader," an open shelf collection has been started on a modest scale. The chief difficulty in the growth of this feature of the work, lies in the undue expense for transportation involved in the case of single volumes. A parcels post would serve to remove what now frequently renders prohibitive the loan of much-sought books whose large cost prevents the smaller of the libraries from acquiring them. Groups of ten to thirty books from the open shelf collection are, by way of experiment, sent to some of these libraries, with a two-month limit. This plan promises good results, especially when the arrival of the collection is suitably advertised locally, but the period of trial has been too brief as yet for final conclusions.

IV

LEGISLATIVE REFERENCE

By increasing the annual appropriation for the Legislative Reference Department from $4,500 to $15,000, the Legislature has rendered possible a large amplification of the work entrusted to this department. The increased appropriation has been

coupled with a number of specific directions, imposing additional duties. Some of these, calling for the indexing of the session laws and other public documents, involve largely increased work. The indexing of the private, local and special laws of Wisconsin has been completed by Dr. Lauros McConachie, who has practically spent a year in carefully indexing these laws. This completes the record of legislation in the department, with a few exceptions. It will be necessary, in addition, to get the recent up-to-date cases and put them with the index of cases. The department is about a year behind in this work. A set of Dickey's Annotations should also be mounted upon our cards, giving the record of cases interpreting the statutes. It would be well, in addition to this, to compile the opinions of the attorney generals and note them upon the cards with the other annotations.

Dr. McConachie's work has been examined by a majority of the members of the Committee upon Statute Revision, and they are well impressed with the work done.

The economic conditions which obtain in Wisconsin to-day are very different from those of thirteen years ago. As a result, the general legislation of to-day runs, often, in conflict with old special rights which were created under charters or franchises by special laws. It was customary in former times to make a special law about anything that seemed to need attention. If one wanted to have his name changed, he had to go to the legislature. If one wanted to have any provision put into the charter of a city, he had to go to the legislature. A school district could not be formed without going to the legislature. To-day when new boundaries are being made, or new conditions coming, it is essential to ascertain first of all, what the statute law is, and then to find out what old rights have been granted by these special laws, which may involve vested interests. Great confusion has arisen in our statute laws because of this. The same problem has come up in other states, and in four or five of them indexes have been made of these private, local and special laws.

The index from 1901 to the present time completes the index of special laws, but as soon as possible this index should be combined with the one which Dr. McConachie has completed.

thus furnishing a cumulative index. When the Statute Revision Committee meets, the members will have before them this index to show what private, local and special laws exist, so that in case any of these laws conflict with the statute laws, they can be traced. The whole matter has been in great confusion in the past.

There has been much agitation over water-ways in this state, and yet it has been simply impossible to tell what dam rights had been given away in the past, what had been repealed, or what still existed. This, now can be traced out very easily by means of Mr. McConachie's index. Not only is this index of the greatest value to lawyers and legislators, but it is of large historical value. Law shows what economic facts have arisen in a community. The development of legislation from 1836 to the present time, the varying economic, industrial, and social conditions of the state, are pictured in this way. A great mine of historical material is contained in the proceedings of the different agricultural societies, the dairymen's associations and horticultural associations, etc. An index of this material would be of the greatest value. Such an index was made by this Department and was destroyed in the capitol fire of 1904. It takes a long while to make an index of this sort, but it would be advisable to undertake it again.

From a summary of work performed and recommendations for future development submitted by Dr. Chas. McCarthy, chief of the department, the subjoined extracts are taken:

In my last report I recommended that a draftsman be secured for the legislative session. The legislature insisted that we secure three men to do this work. The experiment has been successful and of the highest importance to the welfare of the state. We should have ten men working on this work.

I recommended that an index be made of special reports and important data in the Journals. With the assistance of work done previously to the fire by me, in this department, the work has now been put into shape and subject cards are now being made for it. When this is completed and the New York Index of documents now being prepared by Miss Hasse is completed, we will have a great mine of administrative and legislative data opened to us. This work is fundamental to any progress in the study of administrative law. Until we get the criticisms of administrative officers upon the working of laws, we will always be in the dark. There is a wide-spread movement now among lawyers and thinkers in this state and other states to gather such administrative data and also to gather, classify, and index the decisions of commissions and quasi-judicial bodies, such as attorneys general.

Legislative Reference

We have made great strides for our state in our department the past year, and the work here will be in my opinion the basis of all such work for the entire country. At least nine state libraries have now copied our cards which bear upon comparative data and many other libraries have copied data of similar nature relating to administrative criticism. So important is this material that it has been recently and successfully quoted in a brilliant brief before the Supreme Court of the United States. Lawyers are recognizing the importance of this work, and briefs are now frequently filed before our supreme court, containing reference to the peculiar material which we have gathered in our department. This is notably so in matters of comparative law.

I recommend that, when our financial condition will justify it, specially trained workers be secured to take up each of the important branches of statute law. For instance, we need at once, a man trained in and familiar with municipal institutions to do special work in the gathering of critical data upon our city laws. It would save great sums in the end for the municipalities of the state, and lead to better conditions and economy. We also need an expert who thoroughly understands labor legislation, as there is no more important topic before our people at this time.

I recommend that a record of bills and committee hearings be kept during the session. We indexed and kept records of bills, etc., and the legislature issued a bulletin giving the rest of this information. The scheme worked fairly well, but needs considerable modification in detail. It is along the right line—publicity and information in legislative work, and we shall do all we can to improve the machinery in the future. Of course the work requires especially trained indexers. We should secure four of these for the legislative session, as soon as the legislature shall see fit to furnish the funds.

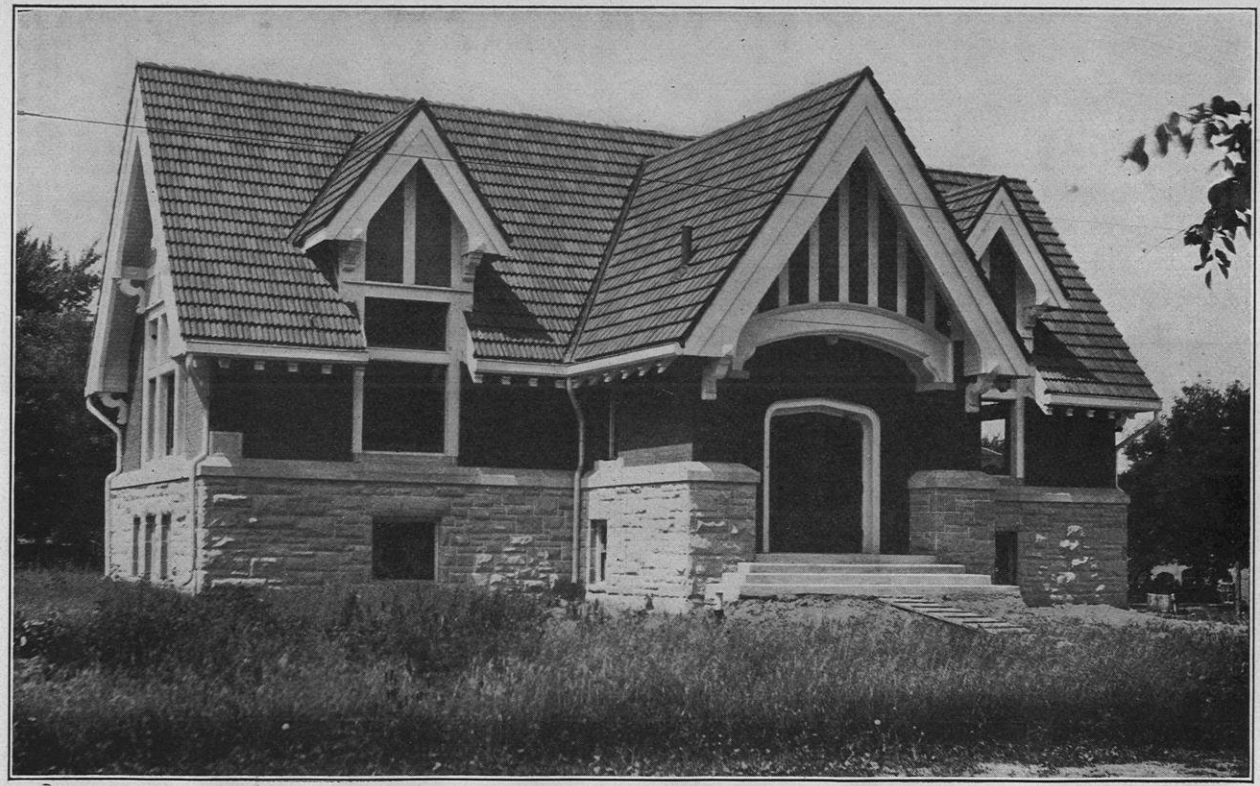
I mentioned in my reports that there was a demand that the agricultural documents be indexed. We did not receive an appropriation for this purpose. It is too bad that this work has not been taken up, as a large part of the economic history of this state is contained in these volumes. We shall try to do it in the future, but the demands of the legislature upon this department are so great that it seems impossible to take it up at once.

We have accomplished the following, in addition:

1. We have cut up the pages of statutes and session laws, mounted them on cards and made a complete card file of them, thus putting together all our statute laws, so that mistakes will not be made, as they have been in the past, in the matter of duplication. This work and the annotations has required over 40,000 cards.

2. We have in like manner cut up and mounted the statutes and session laws, and put them in loose leaf volumes, thus making a complete volume of the statutes up to date. This will serve as a check on the card system and will be of the greatest service to the Statute Revision Committee. No one who has not worked with statute laws can understand what a great and important task this work has been, the enormous detail involved, and the patient supervision which was necessary. We have now twenty volumes with over 12,000 leaves.

3. We have issued bulletins upon the Initiative and Referendum, the Recall, the work of the Legislative Reference Department, and have now ready, Juvenile Courts, Party Declarations in Primary Elections and one on Majority Nominations in Primary Elections and Interchange of Telephone Service. Five other pieces of work have been done by students, and are to be printed by the University. I hope



PUBLIC LIBRARY BUILDING, DURAND.

Legislative Reference

that arrangements can be made with the University so that these bulletins will be issued as University bulletins. It seems to me that it would add greatly to their usefulness. This work ought to be done (and I trust it will eventually be done) at Washington. What has been done by the American Bar Association and the New York State Library, is of the greatest importance.

4. We have continued the work of getting important lists of material existing in other libraries in the city. We have been materially aided in this work by students of the library school. This work is money saving, as it prevents duplication and makes accessible here at the Capitol, the contents of the splendid libraries of our city. It should be continued in the future, so that eventually this department will be a catalogue station for material in other libraries rather than a library by itself. In this connection the thanks of the Commission are due to Mr. Gilson Glazier and Miss Harriet Imhoff of the State Library for their splendid cooperation. They have turned over to us cards which give us the results of all the work now done in that library. It has already saved a good sum in preventing duplication and has added to the efficiency of our work. In this connection I wish to say that our relations with the Historical Society and the University Library have been most cordial and they have been of the greatest service to us. Eventually they will be the storehouse of the data we are gathering. We have sent over three thousand pamphlets and volumes to the Historical Society the past year, and as fast as our material becomes of historical worth, we shall turn it over to that body. As the room and facilities of that library shall increase, the efficiency of our work can be increased.

5. We have been at work on a classification of the quasi legal, quasi economic data beneath the making of statute law. This work requires profound study, and is simply gigantic. With our puny efforts we can make but the beginning. Others must take this work up for an indefinite time to come. We should have twenty thousand dollars a year for this work alone. If those of us who have done this work should leave it or die, this classification will allow the work to be done by others. It is simply a record such as a business house would require from its workers. We have put copies of this in different places so that in case of fire, the record will be preserved. We have also sent copies of our comparative list to the Congressional Library at Washington.

Statistics of Libraries

LIBRARIES CLASSED ACCORDING TO POPULATION

1907–08

Less than 1,000

Abbotsford 893
Avoca 411
Belleville 423
Cedar Grove 411
Colby 849
Colfax 640
Delafield 632
E Milwaukee 473
Eleva 331
Elkhart 462
Fairchild 806
Galesville 876
Genoa Junction 710
Glenbeulah 300
Glenwood 905
Hartland 673
Hillsboro 804
Hortonville 890
Independence 663
Ironton
Johnson Creek 494
La Valle 359
Lone Rock 604
Loyal 815
Markesan 787
Mazomanie 863
Menomonee Falls 936
Milton Junction 500
Mosinee 530
North Freedom 578
Oakfield 548
Orfordville 439
Pewaukee 763
Prairie du Sac 671
Prentice 863
Prescott 889
Randolph 818
Shiocton 491
Spring Green 770
Thorp 878
Token Creek
Wausaukee
Westby 767
Whitehall 700

1,000–5,000

Algoma 2,008
Arcadia 1,316
Bayfield 1,689
Berlin 4,638
Black River Falls 1,946
Boscobel 1,634
Brodhead 1,667
Burlington 2,625
Clintonville 1,837
Columbus 2,388
Cumberland 1,493
Darlington 1,843
Delavan 2,321
De Pere 4,523
Dodgeville 2,152
Durand 1,359
Edgerton 2,416
Elkhorn 1,818
Elroy 2,011
Evansville 1,963
Ft. Atkinson 3,300
Hartford 2,052
Hayward 2,900
Horicon 1,558
Hudson 3,220
Jefferson 2,572
Kaukauna 4,991
Kewaunee 1,719
Kilbourn 1,091
Ladysmith 1,720
Lake Geneva 3,449
Lake Mills 1,602
Lancaster 2,555
Mayville 1,793
Medford 1,923
Mineral Point 3,252
Mondovi 1,450
Monroe 4,269
Neillsville 2,117
New London 3,002
New Richmond 1,824
N. Fond du Lac 1,944
N. Milwaukee 1,236
Oconomowoc 3,013
Oconto Falls 1,301
Omro 1,360
Park Falls 1,438
Peshtigo 2,539
Platteville 4,434
Plymouth 2,764
Port Washington 4,036
Prairie du Chien 3,179
Reedsburg 2,515
Rib Lake 1,122
Rice Lake 3,410
Richland Center 2,635
Ripon 3,811
Seymour 1,118
Shawano 2,446
Shell Lake 1,137
Sparta 3,807
Stanley 2,722
Stoughton 4,244
Sturgeon Bay 4,640
Sun Prairie 1,086
Tomah 3,008
Two Rivers 4,602
Viroqua 2,032
Washburn 4,924
Waterloo 1,106
Waupaca 2,873
Waupun 3,111
Wauwatosa 2,913
West Allis 2,306
West Bend 2,362
Whitewater 3,108

5,000–10,000

Antigo 6,663
Baraboo 5,835
Beaver Dam 5,615
Chippewa Falls 9,009
Grand Rapids 6,157
Marshfield 6,035
Menasha 5,960
Menomonie 5,473
Merrill 9,197
Neenah 6,047
Oconto 5,722
Portage 5,524
Rhinelander 5,435
S. Milwaukee 5,284
Stevens Point 9,022
Watertown 8,623
Waukesha 6,949

10,000–15,000

Ashland 14,519
Beloit 12,855
Janesville 13,770
Manitowoc 12,733
Wausau 14,458

15,000–20,000

Appleton 17,000
Eau Claire 18,737
Fond du Lac 17,284
Kenosha 16,235
Marinette 15,354

Over 20,000

Green Bay 23,584
La Crosse 29,078
Madison 24,301
Milwaukee 312,948
Oshkosh 30,575
Racine 32,290
Sheboygan 24,026
Superior 36,551

Statistics of Libraries

LIBRARIES CLASSED ACCORDING TO NUMBER OF BORROWERS

1907-08

500 or less

Abbotsford 373
Algoma
Belleville 129
Boscobel 560
Cedar Grove
Clintonville 487
Colby 240
Colfax 175
Delafield 210
East Milwaukee 58
Eleva 261
Elkhart 225
Fairchild 200
Genoa Junction 427
Glenbeulah (not given)
Hartland 363
Hillsboro 400
Horicon 415
Hortonville 452
Independence 180
Ironton 200
Johnson Creek 229
La Valle 379
Lone Rock 100
Mazomanie 375
Menomonee Falls 321
Milton Junction 199
Mosinee 400
Mt. Horeb
No. Fond du Lac
North Freedom 274
Oakfield 307
Oconto Falls 382
Omro 320
Orfordville 172
Park Falls 360
Pt. Washington 329
Prairie du Sac 350
Prescott 324
Randolph 281
Rib Lake 325
Seymour 148
Shell Lake 339
Shiocton 478
South Milwaukee 280
Spring Green 276
Sun Prairie 314
Thorp 500
Token Creek
Waterloo 371
Wausaukee 340
West Allis 315
Westby 480

500-1,000

Arcadia 858
Bayfield 868
Black River Falls 547
Brodhead 665
Cumberland 670
Durand 614
Elkhorn 575
Elroy 628
Ft. Atkinson 693
Hartford 837
Hayward 903
Kewaunee 629
Ladysmith 705
Lake Mills 870
Lancaster 995
Mayville 610
Mineral Point 818
New Richmond 838
North Milwaukee 642
Oconomowoc 912
Peshtigo 938
Pewaukee 672
Two Rivers 576
Wauwatosa 837
West Bend 954
Whitehall 800

1,000-2,000

Beaver Dam 1,553
Berlin 1,384
Columbus 1,171
Darlington 1,016
De Pere 1,116
Edgerton 1,533
Evansville 1,071
Hudson 1,668
Kaukauna 1,916
Kilbourn 1,866
Lake Geneva 1,780
Marshfield 1,845
Medford 1,521
Menasha 1,534
Merrill 1,855
Mondovi 1,117
Monroe 1,957
New London 1,091
Platteville 1,839
Plymouth 1,186
Reedsburg 1,289
Rice Lake 1,366
Richland Center 1,229

1,000-2,000

Ripon 1,619
Shawano 1,426
Sparta 1,724
Stanley 1,363
Sturgeon Bay 1,145
Tomah 1,366
Viroqua 1,027
Washburn 1,550
Waupaca 1,380
Waupun 1,330

More than 2,000

Antigo 4,425
Appleton 3,830
Ashland 3,264
Baraboo 2,274
Beloit 5,548
Chippewa Falls 4,341
Eau Claire 6,604
Fond du Lac 4,146
Grand Rapids 2,391
Green Bay 5,526
Janesville 6,765
Kenosha 5,720
La Crosse 11,303
Madison 11,747
Manitowoc 3,430
Marinette 4,729
Menomonie 2,376
Milwaukee 190,570
Neenah 2,562
Neillsville 2,319
Oconto 3,364
Oshkosh 7,654
Portage 3,093
Racine 7,522
Rhinelander 2,299
Sheboygan 5,315
Stevens Point 5,401
Stoughton 2,048
Superior 9,128
Watertown 3,300
Waukesha 3,430
Wausau 3,073
Whitewater 3,328

Statistics of Libraries

LIBRARIES CLASSED ACCORDING TO NUMBER OF VOLUMES
1907-08

Less than 1,000

Abbotsford 776
Algoma
Cedar Grove
Clintonville 828
Colby 800
Colfax 229
Delafield 698
East Milwaukee 247
Eleva 457
Elkhart 222
Fairchild 386
Genoa Junction 851
Glenbeulah 718
Hillsboro
Hortonville 403
Independence 666
Ironton 300
Johnson Creek 383
Ladysmith 690
La Valle 757
Lone Rock 700
Mazomanie 582
Menomonee Falls 210
Milton Junction 210
N Fond du Lac
N Freedom 602
Oconto Falls 670
Omro 663
Orfordville 460
Park Falls 399
Peshtigo 491
Pt Washington 600
Prairie du Sac 654
Prescott 800
Randolph
Rib Lake 540
Seymour 796
Shell Lake 560
Shiocton 762
S Milwaukee 400
Spring Green 657
Sun Prarie 697
Token Creek 262
Waterloo 982
West Allis 550
Westby 524

1,000-2,500

Arcadia 1,674
Belleville 2,195
Black River Falls 2,062
Boscobel 1,279
Brodhead 1,520
Delavan 2,332
Dodgeville 1,317
Durand 2,172
Elroy 1,395
Hartford 1,007
Hartland 1,024
Hillsboro 1,064
Horicon 1,429
Kewaunee 1,696
Lancaster 2,388
Mayville 1,001
Medford 2,262
Mondovi 1,748
Mosinee 1,970
New London 2,025
New Richmond 1,801
North Milwaukee 1,370
Oakfield 1,135
Pewaukee 1,814
Platteville 1,963
Shawano 1,277
Sturgeon Bay 1,560
Thorp 1,291
Wausaukee 1,538
Whitehall 1,898

2,500-5,000

Antigo 3,667
Bayfield 3,584
Berlin 3,989
Columbus 3,471
Cumberland 2,637
Darlington 3,813
De Pere 4,443
Edgerton 2,844
Elkhorn 3,952
Evansville 2,947
Fort Atkinson 3,446
Hayward 3,807
Hudson 3,377
Kaukauna 3,793
Kilbourn 2,938
Lake Geneva 4,179
Lake Mills 2,859
Mineral Point 4,774
Neillsville 2,823
Oconomowoc 4,905
Plymouth 2,819
Reedsburg 3,093
Rhinelander 4,904
Rice Lake 3,866

2,500-5,000

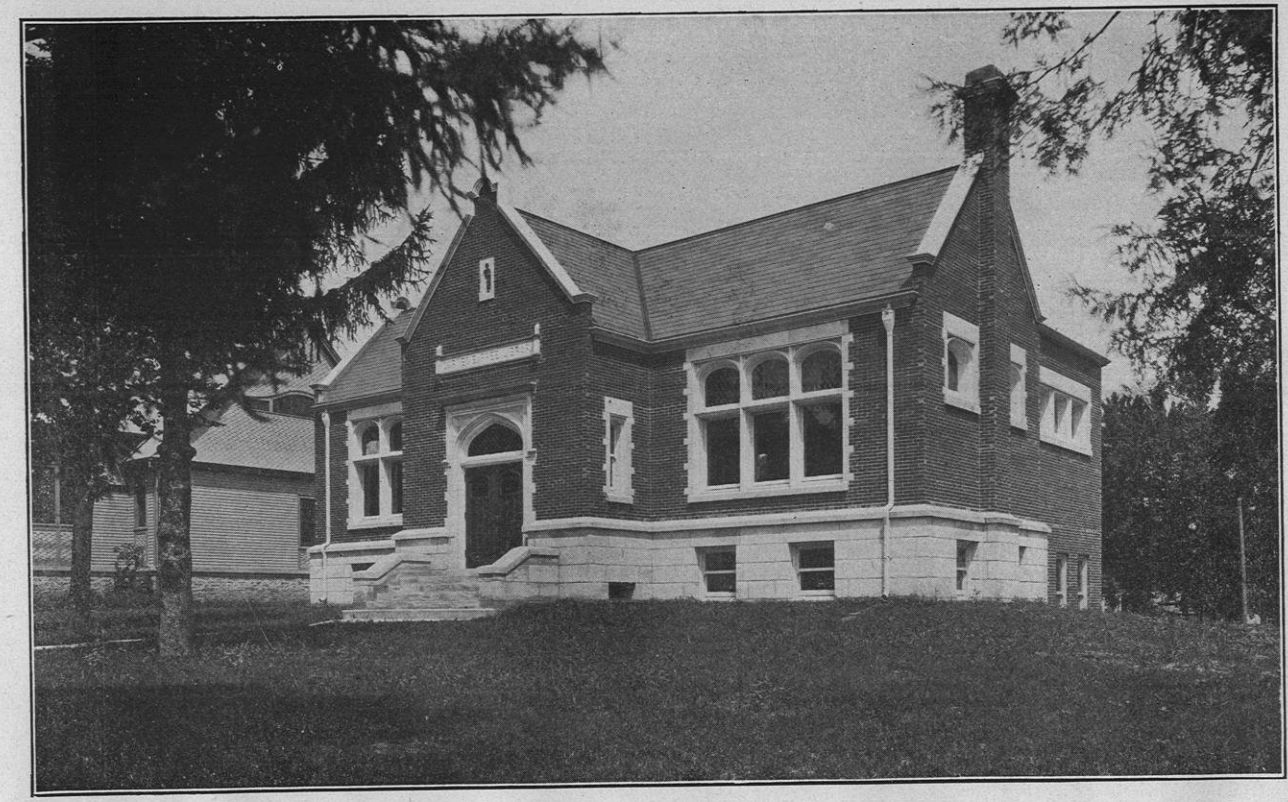
Richland Center 3,036
Ripon 4,991
Stanley 2,780
Stoughton 3,126
Tomah 2,839
Two Rivers 3,886
Viroqua 3,313
Washburn, 4,570
Watertown 5,312
Waupaca 3,252
West Bend 2,593

5,000-10,000

Ashland 5,237
Baraboo 6,943
Beaver Dam 8,076
Chippewa Falls 8,350
Grand Rapids 6,222
Manitowoc 8,683
Marshfield 5,360
Menasha 7,360
Monroe 6,450
Oconto 6,018
Portage 7,886
Sheboygan 8,967
Sparta 6,334
Stevens Point 6,498
Waukesha 6,072
Waupun 6,113
Wausau 5,130
Wauwatosa 5,211
Whitewater 5,780

Over 10,000

Appleton 10,520
Beloit 11,350
Eau Claire 17,852
Fond du Lac 24,364
Green Bay 14,517
Janesville 20,242
Kenosha 18,302
La Crosse 16,865
Madison 20,123
Marinette 13,540
Menomonie 12,507
Merrill 11,708
Milwaukee 181,597
Neenah 10,808
Oshkosh 20,414
Racine 15,550
Superior 18,006



PUBLIC LIBRARY BUILDING, DARLINGTON.

Statistics of Libraries

LIBRARIES CLASSED ACCORDING TO CIRCULATION.

1907-08.

Less than 1,000

Colfax 669
Delafield* 491
East Milwaukee 301
Elkhart
Johnson Creek 383
Orfordville 639
Prescott 426
Token Creek

1,000-2,500

Colby 1,366
Eleva 1,200
Fairchild 2,269
Hartland 1,909
Hillsboro 2,136
Independence 2,279
Lone Rock 1,500
Seymour 1,973
Shiocton
Spring Green 2,413
Westby

2,500-5,000

Bayfield 4,767
Belleville 2,770
Clintonville 5,053
Genoa Junction 3,695
Horicon 3,219
Hortonville 2,943
La Valle 2,657
Mazomanie 3,992
North Freedom 3,188
Oakfield 3,728
Oconto Falls 3,414
Omro 4,541
Pewaukee 4,080
Prairie du Sac 3,316
Rib Lake 2,561
Shell Lake 4,140.
Sun Prairie 3,211

5,000-10,000

Abbotsford 5,333
Arcadia 5,336
Black River Falls 8,745
Brodhead. 9,254

*Since Feb., 1908.

5,000-10,000

Cumberland 9,704
Dodgeville 5,717
Durand 8,720
Elkhorn 8,214
Elroy 5,694
Hartford 9,902
Lake Mills 8,952
Mayville 5,019
Medford 9,160
Mosinee 5,329
New London, 9,525
New Richmond 8,045
North Milwaukee 5,750
Shawano 6,813
Thorp 5,915
West Bend 9,577
Whitehall 5,351

10,000-25,000

Antigo 24,773
Ashland 21,461
Berlin 16,910
Columbus 18,298
Darlington 12,410
De Pere 20,376
Edgerton 16,475
Evansville 14,626
Ft. Atkinson 11,541
Hayward 14,121
Hudson 20,946
Kaukauna 18,466
Kewaunee 15,043
Kilbourn 13,591
Lake Geneva 12,823
Lancaster 10,765
Marshfield 21,185
Merrill 23,279
Mineral Point 12,146
Mondovi 10,100
Neillsville 10,104
Oconomowoc 10,281
Peshtigo 10,559
Platteville 17,461
Plymouth 15,522
Reedsburg 10,642
Rhinelander 22,673
Rice Lake 18,353

10,000-25,000

Richland Center 13,695
Ripon 15,178
Stanley 12,146
Stoughton 22,576
Sturgeon Bay 15,373
Tomah 17,674
Two Rivers 14,560
Viroqua 12,954
Washburn 22,623
Waupaca 15,029
Waupun 16,614
Wausaukee 10,005
Wauwatosa 11,974
Whitewater 23,419

Over 25,000

Appleton 52,483
Baraboo 29,373
Beaver Dam 27,438
Beloit 52,610
Chippewa Falls 40,661
Eau Claire 56,200
Fond du Lac 54,769
Grand Rapids 25,189
Green Bay 58,552
Janesville 66,000
Kenosha 80,476
La Crosse 82,259
Madison 79,501
Manitowoc 45,187
Marinette 51,741
Menasha 25,461
Menomonie 47,853
Milwaukee, 697,566
Monroe 25,902
Neenah 30,925
Oconto 37,357
Oshkosh 92,393
Portage 32,502
Racine 105,759
Sheboygan 49,086
Sparta 27,445
Stevens Point 70,501
Superior 88,283
Watertown 35,372
Waukesha 27,800
Wausau 50,955

Statistics of Libraries

LIBRARIES CLASSED ACCORDING TO CITY TAX LEVY

1907–08

$100 or less

Colby $85
Colfax $100
East Milwaukee $25
Eleva $15
Fairchild $50
Genoa Junction $30
Johnson Creek $75
Lone Rock $60
Mazomanie $75
Mosinee $100
North Freedom $40
Orfordville $50
Pt. Washington $50
Randolph $50
Seymour $75
Shell Lake $100
Shiocton $50
Spring Green $30
Westby $100

$100–$200

Dodgeville $200
Hillsboro $200
La Valle $150
Milton Junction $150
North Fond du Lac
Oakfield $150
Oconomowoc
Oconto Falls $144
Omro $150
Park Falls $300
Peshtigo $125
Pewaukee $144
Rib Lake $200
South Milwaukee $200
Thorp

$200–$300

Abbotsford $240
Belleville $204
Hartford $300
Horicon $300
Merrill $250
Mineral Point $250
Prairie du Sac $250
Shawano $300
Whitehall $250

$300–$500

Arcadia $500
Black River Falls $500
Brodhead $500
Clintonville $399
Elkhorn $500
Kilbourn $420
Medford $500
Menomonee Falls $304
Mondovi $350
New London $450
New Richmond $485
North Milwaukee $400
Platteville $500
West Allis $500
West Bend $350

$500–$1,000

Ashland $1,000
Bayfield $1,000
Berlin $1,000
Columbus $1,000
Cumberland $1,000
Darlington $1,000
Durand $750
Edgerton $1,000
Evansville $1,000
Ft. Atkinson $657
Grand Rapids $1,000
Hayward $1,000
Independence $550
Kewaunee $560
Ladysmith $1,000
Lancaster $600
Neillsville $565
Plymouth $982
Reedsburg $600
Rice Lake $1,000
Richland Center $1,000
Stanley $1,000
Tomah $750
Viroqua $1,000
Waupaca $600
Waupun $1,000
Wauwatosa $1,000

$1,000–$1,500

Antigo $1,500
Beaver Dam $1,281
De Pere $1,171
Hudson $1,200
Kaukauna $1,200
Lake Geneva $1,406
Marshfield $1,473
Monroe $1,500
Oconto $1,500
Portage $1,400
Ripon $1,200
Sparta $1,503
Stoughton $1,300
Sturgeon Bay $1,075
Two Rivers $1,050
Waukesha $1,500
Whitewater $1,200

$1,500–$2,000

Baraboo $1,850
Rhinelander $1,800
Stevens Point $2,000
Washburn $1,800
Watertown $2,000

$2,000–$3,000

Appleton $2,500
Chippewa Falls $2,125
Menasha $2,422
Neenah $2,523
Wausau $2,900

$3,000–$4,000

Beloit $4,000
Janesville $4,000
La Crosse $4,000
Manitowoc $3,150

$4,000–$5,000

Eau Claire $5,000
Fond du Lac $5,000
Green Bay $4,500
Marinette $4,250
Oshkosh $5,000
Sheboygan $4,490

$5,000–$10,000

Madison $7,500
Racine $7,500
Superior $8,000

Over $10,000

Kenosha $16,060
Milwaukee $64,507

Statistics of Libraries

TRAVELING LIBRARY STATISTICS

June 30, 1908

	Libraries	Groups	Books
English 50 vol. libraries	218	....	12,359
English 25 vol. libraries	30	....	890
English Fiction libraries	17	....	431
English Children's libraries	8	....	344
English Rental libraries	13	....	651
English Study libraries	66	....	2,163
Town libraries (100 vols. each)	10	....	1,001
Miscellaneous (not in series)	3	....	204
Total	365		18,043
German	95 (3,463)	114 (1,145)	4,611
Norwegian	36 (1,260)	30 (322)	1,582
Polish	5 (172)	27 (270)	442
Bohemian		10 (116)	116
Total	136 (4,898)	181 (1,853)	6,751
Grand total	501	181	24,794

TRAVELING LIBRARY STATIONS

July 1, 1907-July 1, 1908

Number of stations July 1, 1907	321
Added during year	61
Discontinued during year	7
Re-established during year	13
Total number July 1, 1908	388

TOTAL CIRCULATION

July 1, 1907-July 1, 1908

English and foreign, 98,891		
English (general)	52,461	
Town	10,442	
New book	4,516	
Fiction	3,069	
Young folks	1,292	
Study	925	
Total English	72,705	
		Groups
German	18,243	1,562
Scandinavian	5,050	519
Polish	470	99
Bohemian	.....	243
Total foreign	23,763	2,423

COUNTY TRAVELING LIBRARIES

County.	Total no. libraries.	Total no. stations.	Circulation 1906-1907.
Columbia	18	13	3,098
Dodge	12	11	1,365
Dunn	37	35	.....
Jefferson	20	18	3,700
La Crosse	22	21	3,807
Marinette	27	31	9,255
Oconto	18	10	4,773
Portage (no report)	....	....	.....
Sauk	17	17	4,293
Trempealeau	12	10	3,319
Winnebago (no report)	....	....	.....
Wood	35	22	2,820
Total	218	188	36,430

Statistics of Libraries

CIRCULATION OF BOOKS
1907–08

Place	Vols. added.	Total vols.	Borrowers	Circulation
Abbotsford	55	776	373	5,333
Algoma (no report)	....	....	....	....
Antigo	378	3,667	4,425	24,773
Appleton	531	10,520	3,830	52,483
Arcadia	121	1,674	858	5,336
Ashland	551	5,237	3,264	21,461
Avoca (no report)	....	....	....	....
Baraboo	589	6,943	2,274	29,373
Bayfield	386	3,584	868	4,767
Beaver Dam	418	8,076	1,553	27,458
Belleville	46	2,195	129	2,770
Beloit	702	11,350	5,548	52,610
Berlin	272	3,989	1,384	16,910
Black River Falls	145	2,062	547	8,745
Boscobel	....	1,279	560	....
Brodhead	274	1,520	665	9,254
Cedar Grove (no report)	....	....	....	....
Chippewa Falls	547	8,350	4,341	40,661
Clintonville	140	828	487	5,053
Colby	44	800	240	1,366
Colfax	....	229	175	669
Columbus	218	3,471	1,171	18,298
Cumberland	334	2,637	670	9,704
Darlington	287	3,813	1,016	12,410
Delafield	60	698	210	*491
Delavan	1,646	2,332	(not given)	(not given)
De Pere	336	4,443	1,116	20,376
Dodgeville	237	1,317	....	5,717
Durand	172	2,173	614	8,720
East Milwaukee	2	247	58	301
Eau Claire	1,066	17,852	6,604	56,200
Edgerton	402	2,844	1,533	16,475
Eleva	....	457	261	1,200
Elkhart Lake	(not given)	222	225	(not given)
Elkhorn	156	3,952	575	8,214
Elroy	501	1,395	628	5,694
Evansville	454	2,947	1,071	14,626
Fairchild	53	386	200	2,269
Fond du Lac	893	24,364	4,146	54,769
Fort Atkinson	78	3,446	693	11,541
Genoa Junction	173	851	427	3,695
Glenbeulah	....	718	(no report)	(no report)
Glenwood (no report)	....	....	....	....
Grand Rapids	893	6,222	2,391	25,189
Green Bay	1,278	14,517	5,526	58,552
Hartford	69	1,007	837	9,902
Hartland	16	1,024	363	1,909
Hayward	238	3,807	904	14,121
Hillsboro	(no report)	1,064	400	2,139
Horicon	165	1,429	415	3,219
Hortonville	32	409	452	2,943
Hudson	241	3,377	1,668	20,946
Independence	481	666	180	2,279
Ironton	(not reported)	300	200	(no report)
Janesville	1,108	20,242	6,765	66,000
Johnson Creek	(not reported)	383	229	383
Kaukauna	308	3,793	1,916	18,466
Kenosha	1,760	18,302	5,720	80,476
Kewaunee	188	1,696	629	15,043
Kilbourn	229	2,938	806	13,591
La Crosse	1,384	16,865	11,303	82,259
Ladysmith	360	690	705	(not given)
Lake Geneva	406	4,179	1,780	12,823
Lake Mills	234	2,859	870	8,952
Lancaster	159	2,388	995	10,765
La Valle	88	592	379	2,657
Lone Rock	....	700	100	1,500
Loyal	....	....	....	....
Madison	2,779	20,123	11,747	79,501
Manitowoc	512	8,683	3,430	45,187
Marinette	1,234	13,540	4,729	51,741
Marshfield	412	5,360	1,845	21,185
Mayville	55	1,001	610	5,019
Mazomanie	25	582	375	3,992
Medford	....	2,262	1,521	9,160

*Circulation since February 22, 1908

PUBLIC LIBRARY BUILDING, RICHLAND CENTER.

Statistics of Libraries

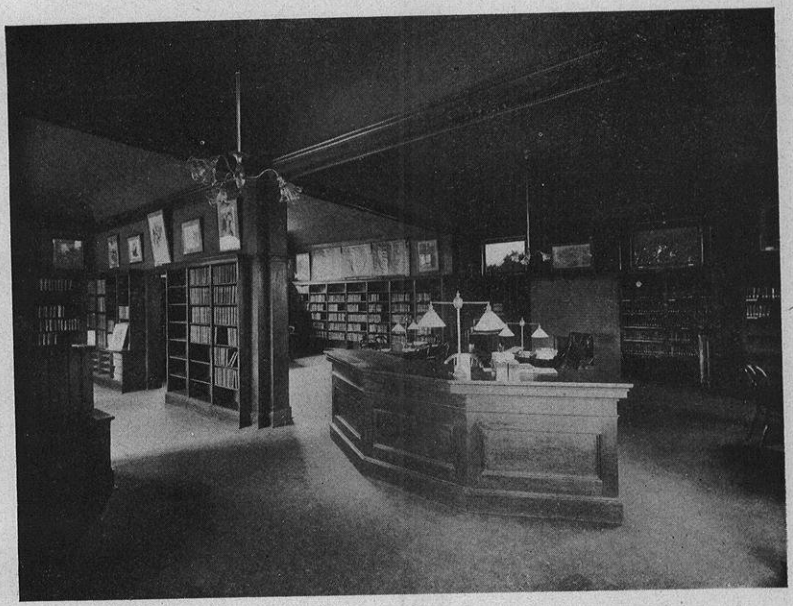
CIRCULATION OF BOOKS—continued
1907–08

Place	Vols. added	Total vols.	Borrowers	Circulation
Menasha	471	7,360	1,534	25,461
Menomonee Falls	88	210	321	....
Menomonie	692	12,507	2,376	47,853
Merrill	567	11,708	1,855	23,279
Milton Junction	135	210	199	....
Milwaukee	12,254	181,597	190,570	697,566
Mineral Point	253	4,774	818	12,146
Mondovi	158	1,748	1,117	10,100
Monroe	565	6,450	1,957	25,902
Mosinee	123	1,970	400	5,329
Neenah	695	10,808	2,562	30,925
Neillsville	64	2,823	2,319	10,104
New London	337	2,025	1,091	9,525
New Richmond	476	1,801	838	8,045
North Fond du Lac	....	....	....	....
North Freedom	59	602	274	3,188
North Milwaukee	266	1,370	642	5,750
Oakfield	79	1,135	307	3,728
Oconomowoc	175	4,905	912	10,281
Oconto	494	6,018	3,367	37,357
Oconto Falls	19	370	382	3,414
Omro	42	663	520	4,541
Orfordville	29	460	172	639
Oshkosh	1,831	20,414	7,654	92,393
Park Falls	85	399	360	(not given)
Peshtigo	8	491	938	10,559
Pewaukee	159	1,814	672	4,080
Platteville	225	1,463	1,839	17,461
Plymouth	418	2,810	1,186	15,522
Portage	401	7,885	3,093	32,502
Port Washington	55	600	329	....
Prairie du Sac	103	654	350	3,316
Prescott	25	800	324	426
Racine	2,393	15,550	7,522	105,759
Randolph	....	....	218	....
Reedsburg	183	3,093	1,288	10,642
Rhinelander	607	4,904	2,299	22,673
Rib Lake	94	540	325	2,561
Rice Lake	227	3,866	1,366	18,353
Richland Center	452	3,036	1,229	13,695
Ripon	334	4,991	1,619	15,178
Seymour	59	796	148	1,973
Shawano	275	1,277	1,426	6,813
Sheboygan	1,157	8,967	5,315	49,086
Shell Lake	259	560	339	....
Shiocton	....	762	478	(not given)
South Milwaukee	56	400	280	(not given)
Sparta	381	6,334	1,724	27,445
Spring Green	8	637	276	2,413
Stanley	249	2,780	1,363	12,146
Stevens Point	373	6,498	5,401	70,501
Stoughton	253	3,126	2,048	22,576
Sturgeon Bay	370	1,560	1,145	15,373
Sun Prairie	76	697	314	3,211
Superior	1,465	18,006	9,129	88,283
Thorp	87	1,291	500	5,945
Token Creek	12	250	15	(not given)
Tomah	343	2,839	1,366	17,674
Two Rivers	169	3,886	576	14,560
Viroqua	339	3,313	1,027	12,954
Washburn	470	4,570	1,550	22,623
Waterloo	121	992	371	(not given)
Watertown	387	5,312	3,300	35,372
Waukesha	468	6,072	3,420	27,800
Waupaca	360	3,252	1,380	15,029
Waupun	206	6,113	1,330	16,614
Wausau	1,332	5,130	3,073	50,955
Wausaukee	3	1,538	340	10,005
Wauwatosa	231	5,211	837	11,974
West Allis	50	500	315	(not given
West Bend	159	2,593	954	9,577
Westby	....	524	480	(not given)
Whitehall	119	1,898	800	5,351
Whitewater	174	5,780	3,328	23,419

Statistics of Libraries

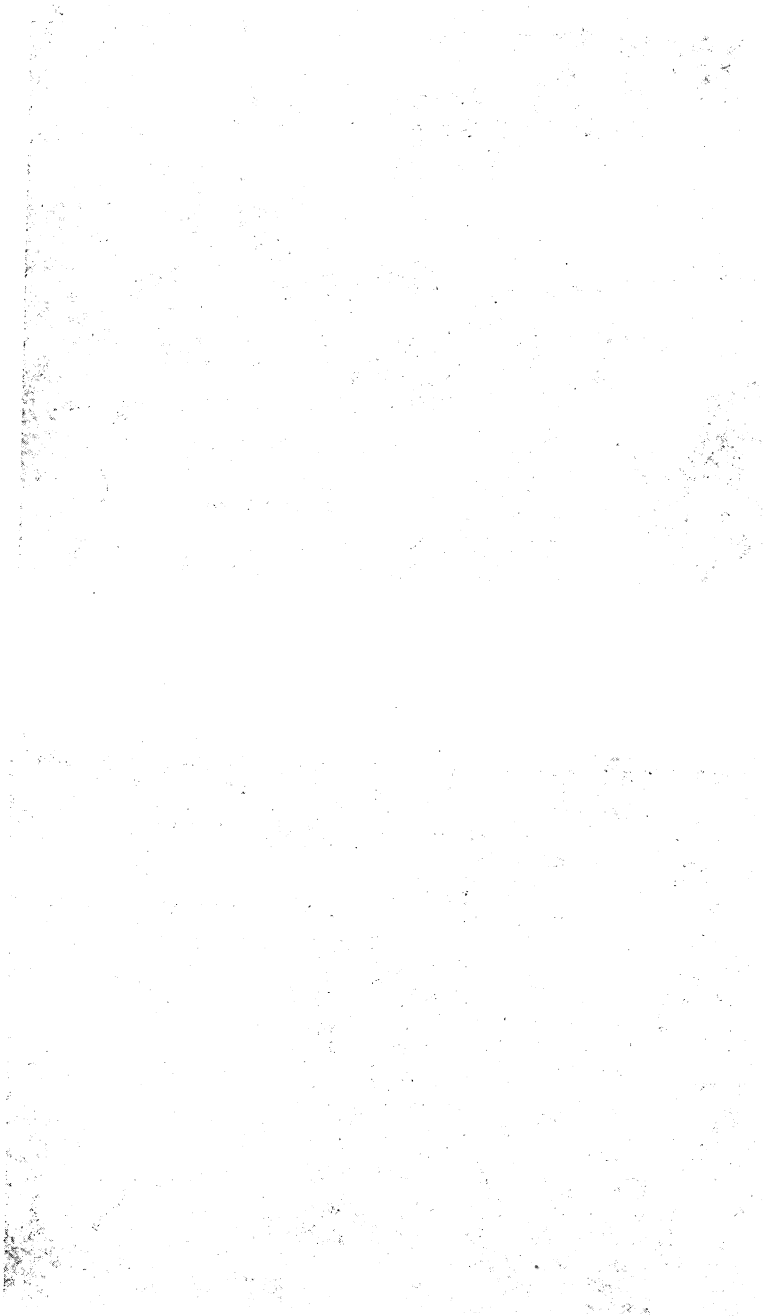
EXPENDITURES FOR BOOKS
1907-08

Place	For books	For periodicals	For binding	Total book expenditures
Abbotsford	$41 26	(inc. periodicals)	....	$41 26
Antigo	130 46	$72 13	$67 05	269 64
Appleton	332 64	99 30	171 90	603 84
Arcadia	195 09	17 80	26 65	239 54
Ashland	381 04	77 50	....	458 54
Baraboo	939 88	52 95	82 36	1,075 13
Bayfield	125 93	36 05	....	161 98
Beaver Dam	496 72	(inc. periodicals)	(not given)	496 72
Belleville	49 62	6 00	....	55 62
Beloit	1,177 46	164 80	265 30	1,607 56
Berlin	243 93	16 98	58 00	318 91
Black River Falls	71 53	27 70	....	99 22
Brodhead	173 20	23 50	24 75	231 45
Cedar Grove	....	....	....	....
Chippewa Falls	298 90	92 85	220 91	612 66
Clintonville	119 43	15 40	....	134 83
Colby	26 57	....	....	26 57
Colfax	(not given)	....	....	....
Columbus	143 27	46 35	33 80	223 42
Cumberland	184 20	52 36	11 10	247 66
Darlington	278 94	68 80	45 36	393 10
Delafield	(not reported)	....	....	....
Delavan	(not reported)	....	....	....
De Pere	237 11	48 20	157 88	443 19
Dodgeville	70 56	....	....	70 56
Durand	113 97	28 69	40 30	182 87
East Milwaukee	(not reported)	....	....	....
Eau Claire	635 07	301 43	332 45	1,268 95
Edgerton	371 92	67 75	54 99	494 66
Eleva	(not given)	....	....	....
Elkhart Lake	(not reported)	....	....	....
Elkhorn	96 55	45 25	32 20	174 00
Elroy	708 18	30 85	....	739 03
Evansville	78 80	40 85	92 39	212 04
Fairchild	21 74	....	....	21 74
Fond du Lac	523 59	140 40	143 00	806 99
Fort Atkinson	61 07	59 85	36 27	382 19
Genoa Junction	94 43	....	6 40	100 83
Glenbeulah	(not reported)	....	....	....
Grand Rapids	715 78	199 27	207 60	1,122 65
Green Bay	1,146 03	168 79	371 28	1,686 10
Hartford	52 99	....	68 45	121 44
Hartland	(not given)	....	....	....
Hayward	164 44	59 10	30 80	254 34
Hillsboro	(not given)	44 10	....	44 10
Horicon	54 41	57 80	(incl. binding)	112 21
Hortonville	28 85	....	....	28 85
Hudson	210 40	75 00	92 45	377 85
Independence	347 83	7 35	....	355 18
Ironton	(not given)	....	....	....
Janesville	438 33	164 15	271 10	873 58
Johnson Creek	....	7 50	....	7 50
Kaukauna	266 71	39 05	96 65	402 41
Kenosha	1,640 25	200 50	371 02	2,211 77
Kewaunee	80 05	30 15	15 00	125 20
Kilbourn	203 20	13 70	....	216 90
La Crosse	1,172 77	201 30	317 70	1,691 77
Ladysmith	212 14	50 90	20 21	283 25
Lake Geneva	260 04	85 65	29 65	375 34
Lake Mills	(not given)	....	....	....
Lancaster	131 79	41 50	45 25	218 54
La Valle	41 61	....	....	41 61
Lone Rock	(not given)	....	....	....
Loyal	....	....	....	....
Madison	1,944 85	320 22	946 57	3,211 64
Manitowoc	290 39	111 00	173 90	575 29
Marinette	960 43	165 38	113 10	1,238 91
Marshfield	262 68	72 05	92 25	426 98
Mayville	27 77	1 50	....	29 27
Mazomanie	38 00	....	8 50	46 50
Medford	72 65	26 00	....	98 65
Menasha	284 47	50 25	59 98	394 70
Menomonee Falls	92 70	7 50	....	100 20
Menomonie	(not given)	....	....	....
Merrill	297 89	15 77	136 92	450 58



CHILDREN'S ROOM—PUBLIC LIBRARY, DARLINGTON.

BOOK AND REFERENCE ROOM—PUBLIC LIBRARY, RICHLAND CENTER.



Statistics of Libraries

EXPENDITURES FOR BOOKS—Continued

1907-08

Place	For books	For periodicals	For binding	Total book expenditures
Milton Junction	$125 35	....	....	$125 35
Milwaukee	10,337 75	$1,496 57	$1,099 18	12,933 50
Mineral Point	135 01	....	17 75	152 76
Mondovi	125 32	42 90	....	168 22
Monroe	494 50	81 80	133 54	709 84
Mosinee	24 22	59 35	14 18	97 75
Neenah	488 51	88 15	132 77	709 43
Neillsville	45 82	18 23	106 15	170 20
New London	136 42	25 60	25 50	187 52
New Richmond	350 57	31 00	26 00	407 57
North Fond du Lac	....	....	....	....
North Freedom	33 70	16 85	1 22	51 77
North Milwaukee	213 94	9 45	....	223 39
Oakfield	56 59	7 62	....	64 21
Oconomowoc	(not given)	7 30	(not given)	7 30
Oconto	277 75	77 45	61 89	417 09
Oconto Falls	18 07	17 20	....	25 27
Omro	40 09 (inc. periodicals and binding)			40 09
Orfordville	22 85	....	....	22 85
Oshkosh	1,995 41	192 58	634 32	2,822 31
Park Falls	52 63	16 10	....	68 73
Peshtigo	(not any)	....	....	....
Pewaukee	110 00	5 00	....	115 00
Platteville	174 24	12 05	25 90	212 19
Plymouth	314 29	36 13	53 35	403 67
Portage	344 76	93 15	10 45	448 36
Port Washington	(not reported)	....	....	....
Prairie du Sac	83 53	15 70	....	99 23
Prescott	26 10	....	....	26 10
Racine	1,785 25	215 03	483 40	2,483 68
Randolph	(not given)	....	....	....
Reedsburg	171 75 (inc. periodicals)		....	171 75
Rhinelander	325 88	52 55	154 49	532 92
Rib Lake	77 08	11 15	16 20	104 83
Rice Lake	210 10	44 10	28 09	282 29
Richland Center	328 78	52 35	94 10	475 23
Ripon	30 00	52 00	137 00	219 00
Seymour	45 41	....	....	45 41
Shawano	170 28	23 35	....	193 63
Sheboygan	1,233 79	86 25	249 74	1,569 78
Shell Lake	9 79	3 00	....	12 79
Shiocton	(not reported)	....	....	....
South Milwaukee	49 50	....	18 70	68 20
Sparta	313 29	61 75	78 03	453 07
Spring Green	14 48	25 00	....	39 48
Stanley	106 40	56 15	23 35	186 20
Stevens Point	249 80	81 50	61 30	392 60
Stoughton	312 83	92 00	100 04	504 87
Sturgeon Bay	391 69	61 40	34 70	387 79
Sun Prairie	42 40	....	20 64	63 04
Superior	1,148 31	273 60	538 21	1,960 12
Thorp	....	....	....	....
Token Creek	25 00	....	....	25 00
Tomah	278 52	29 19	84 45	392 16
Two Rivers	154 61	56 16	17 25	228 02
Viroqua	182 65	18 75	98 49	329 89
Washburn	332 18	67 99	58 75	458 92
Waterloo	(not reported)	....	....	....
Watertown	388 29	90 90	51 39	530 58
Waukesha	235 05	22 85	205 20	463 80
Waupaca	120 40	51 00	43 30	214 70
Waupun	103 78	16 70	40 80	160 56
Wausau	969 12	132 20	73 57	1,174 89
Wausaukee	(not reported)	....	....	....
Wauwatosa	205 02	79 50	....	284 52
West Allis	75 00	....	50 00	125 00
West Bend	126 55	30 50	35 75	192 80
Westby	70 00	....	....	70 00
Whitehall	139 99	23 50	16 80	80 29
Whitewater	304 02	61 25	78 55	43 82

Statistics of Libraries

RECEIPTS OF PUBLIC LIBRARIES
1907–08

Place.	Annual tax levy.	Other receipts including unexpended balance.	Total receipts 1907–08.
Abbotsford	$240 00	$117 95	$357 95
Algoma (no report)	....	....	....
Antigo	1,500 00	1,052 32	2,552 32
Appleton	2,500 00	2,413 06	4,913 06
Arcadia	500 00	476 14	976 14
Ashland	....	28 00	28 00
Baraboo	1,850 00	1,262 34	3,112 34
Bayfield	1,000 00	1,199 62	2,199 62
Beaver Dam	1,281 74	1,512 19	2,793 93
Belleville	204 47	255 90	460 37
Beloit	4,000 00	3,126 91	7,126 91
Berlin	1,000 00	1,159 00	2,159 00
Black River Falls	500 00	181 70	681 70
Boscobel (recently organized)	....	....	....
Brodhead	500 00	867 54	1,367 54
Burlington (recently organized)	....	....	....
Cedar Grove (p)	....	....	....
Chippewa Falls	2,125 00	117 63	2,242 63
Clintonville	399 00	191 31	590 31
Colby	85 84	72 42	158.26
Colfax	100 00	3 00	103 00
Columbus	1,000 00	614 11	1,614 11
Cumberland	1,000 00	752 94	1,752 94
Darlington	1,000 00	74 02	1,074 02
Delafield (no report)	....	....	....
Delavan (recently organized)	....	....	....
De Pere	1,171 47	791 02	1,962 49
Dodgeville	200 00	102 62	302 62
Durand	750 00	308 93	1,058 93
East Milwaukee	25 00	1 50	26 50
Eau Claire	5,000 00	897 89	5,897 89
Edgerton	1,000 00	4,527 73	5,527 73
Eleva	15 00	2 00	17 00
Elkhart Lake	50 00	2 70	52 70
Elkhorn	500 00	554 48	1,054 48
Elroy (recently organized)	....	1,761 02	1,761 02
Evansville	1,000 00	213 52	1,213 52
Fairchild	50 00	21 68	71 68
Fond du Lac	5,000 00	3,117 84	8,117 84
Fort Atkinson	657 00	137 63	794 63
Genoa Junction	30 00	137 75	167 75
Glenbeulah (a)	....	....	....
Glenwood (a)	....	....	....
Grand Rapids	1,000 00	6,532 48	7,532 48
Green Bay	4,500 00	1,727 44	6,227 44
Hartford	300 00	190 91	490 91
Hartland	....	101 87	101 87
Hayward	1,000 00	945 04	1,945 04
Hillsboro	200 00	....	200 00
Horicon	300 00	88 67	388 67
Hortonville	25 00	5 00	30 00
Hudson	1,200 00	884 31	2,084 31
Independence	550 00	1 31	551 31
Ironton (a)	....	30 00	30 00
Janesville	4,000 00	614 48	4,614 48
Jefferson (recently organized)	....	....	....
Johnson Creek	75 00	1 70	76 70
Kaukauna	1,200 00	1,994 05	3,194 05
Kenosha	16,060 86	11,353 30	27,414 16
Kewaunee	560 63	223 75	784 38
Kilbourn	420 51	53 74	474 25
La Crosse	4,000 00	7,868 69	11,868 69
Ladysmith	1,000 00	394 65	1,394 65
Lake Geneva	1,405 95	1,028 97	2,434 92
Lake Mills	(none reported)	22 34	22 34
Lancaster	600 00	793 58	1,393 58
La Valle	150 00	112 50	262 50
Lodi	....	....	....
Lone Rock	60 00	....	60 00
Loyal (no report)	....	....	....
Madison	7,500 00	4,168 92	11,668 92

a Association. *p* Proprietary. *s* School control.

READING ROOM—PUBLIC LIBRARY, EAU CLAIRE.

READING ROOM—PUBLIC LIBRARY, DARLINGTON.

Statistics of Libraries

RECEIPTS OF PUBLIC LIBRARIES—continued

Place.	1907-08 Annual tax levy.	Other receipts including unexpended balance.	Total receipts 1907-08.
Manitowoc	3,150 00	810 10	3,960 10
Marinette	$4,250 00	$341 09	$4,591 09
Markesan (no report)	....	....	....
Marshfield	1,472 95	1,529 09	3,002 04
Mayville (a)	....	418 31	418 31
Mazomanie	50 00	80 00	130 00
Medford	500 00	35 98	535 98
Menasha	2,422 41	2,590 57	5,012 98
Menomonee Falls	304 36	....	304 36
Menomonie (p)	....	....	....
Merrill	250 00	786 12	1,036 12
Milton Junction	150 00	48 55	198 55
Milwaukee	64,507 24	40,560 12	105,067 36
Mineral Point	250 00	505 59	755 59
Mondovi	350 00	253 84	603 84
Monroe (s)	1,500 00	24 79	1,524 79
Mosinee	100 00	999 30	1,099 30
Neenah	2,523 19	567 68	3,090 87
Neillsville	565 03	531 96	1,096 99
New London	450 00	384 76	834 76
New Richmond	485 83	453 98	939 81
North Fond du Lac (no report)	....	....	....
North Freedom	40 00	71 61	111 61
North Milwaukee	400 00	152 82	552 82
Oakfield	150 00	76 84	226 84
Oconomowoc (a)	....	55 37	55 37
Oconto	1,500 00	1,120 13	2,620 13
Oconto Falls	144 00	69 13	213 13
Omro	150 00	133 77	283 77
Orfordville	50 00	83 54	133 54
Oshkosh	5,000 00	5,739 49	10,739 49
Park Falls	300 00	....	300 00
Peshtigo	125 00	66 60	191 60
Pewaukee	144 00	161 00	305 00
Platteville	500 00	554 29	1,054 29
Plymouth	982 50	219 59	1,202 09
Portage	1,400 00	831 09	2,231 09
Port Washington	50 00	6 00	56 00
Prairie du Sac	250 00	210 10	460 10
Prentice (recently organized)	....	....	....
Prescott (a)	....	60 70	60 70
Racine	7,500 00	8,227 60	15,727 60
Randolph	50 00	....	50 00
Reedsburg	600 00	525 74	1,125 74
Rhinelander	1,800 00	1,090 69	2,890 69
Rib Lake	200 00	13 58	213 58
Rice Lake	1,000 00	208 82	1,208 82
Richland Center	1,000 00	133 24	1,133 24
Ripon	1,200 00	184 00	1,384 00
Seymour	75 00	102 99	177 99
Shawano	300 00	338 29	638 29
Sheboygan	4,489 82	3,080 07	7,569 89
Shell Lake	100 00	223 32	323 32
Shiocton	50 00	2 00	52 00
South Milwaukee	200 00	68 42	268 42
Sparta	1,500 00	1,125 78	2,625 78
Spring Green	60 00	7 00	67 00
Stanley	1,000 00	838 51	1,838 51
Stevens Point	2,000 00	1,828 03	3,828 03
Stoughton	1,300 00	1,068 33	2,368 33
Sturgeon Bay	1,075 00	807 42	1,882 42
Sun Prairie	....	120 89	120 89
Superior	8,000 00	5,611 15	13,611 15
Thorp (no report)	....	....	....
Token Creek (a)	....	27 00	27 00
Tomah	750 00	611 14	1,361 14
Two Rivers	1,050 00	625 96	1,675 96
Viroqua	1,000 00	703 15	1,703 15
Washburn	1,800 00	34 48	1,834 48
Waterloo (a)	....	....	....
Watertown	2,000 00	2,148 96	4,148 96

a Association. *p* Proprietary. *s* School control.

Statistics of Libraries

RECEIPTS OF PUBLIC LIBRARIES — continued

1907-08

Place.	Annual tax levy.[1]	Other receipts including unexpended balance.	Total receipts 1907-08.
Waukesha	$1,500 00	$1,264 44	$2,764 44
Waupaca	600 00	139 00	739 00
Waupun	1,000 00	1,674 23	2,674 23
Wausau	2,900 00	5,186 77	8,086 77
Wausaukee (p)	....	....	....
Wauwatosa	1,000 00	686 68	1,686 68
West Allis	500 00	100 00	600 00
West Bend	350 50	371 12	721 62
Westby	100 00	...	100 00
Whitehall	250 00	780 43	1,030 43
Whitewater	1,200 00	896 20	2,096 20

p Proprietary.

COLLEGE AND ACADEMY LIBRARIES

June 30, 1908

Library	*Librarian*	*No. vols.*
Lawrence University, Appleton	Zelia A. Smith	24,053
Northland College, Ashland	M. J. Fenenga	8,000
Wayland Academy, Beaver Dam	Edwin Jennings	2,000
Beloit College, Beloit	James A. Blaisdell	39,500
St. John's Military Academy, Delafield	Madame Kate Maurer	3,000
Grafton Hall, Fond du Lac	Jean Dodd	2,600
Hillside Home, Hillside	Marie Tollefson	2,000
Milton College, Milton	Edwin Shaw	8,200
Concordia College, Milwaukee	Otto Hattstaedt	6,500
Marquette College, Milwaukee	H. S. Spaulding	18,000
Milwaukee Academy, Milwaukee	Julius H. Pratt	1,800
Milwaukee Downer College, Milwaukee	Florence E. Weissert	7,193
St. Lawrence College, Mt. Calvary	Rev. Leo Steinburg	3,400
Sacred Heart College, Prairie du Chien	Rev. J. Horning	12,000
Racine College, Racine	Clara L. Robinson	11,000
St. Catherine's Academy, Racine	Sr. M. Theophila	3,735
Ripon College, Ripon	Florence C. Hays	15,000
Catholic Normal School, St. Francis	Rev. J. M. Kasel	6,007
St. Clara Female Academy, Sinsinawa	Sr. Mary Carnillus	3,785
Northwestern University, Watertown	J. H. Ott	7,480
Sacred Heart College, Watertown		2,856
Carroll College, Waukesha	Amanda Flattery	4,000

Statistics of Libraries

COUNTIES IN WHICH LIBRARIES ARE LOCATED

Adams County
None

Ashland County
Ashland

Barron County
Cumberland
Rice Lake

Bayfield County
Bayfield
Washburn

Brown County
De Pere
Green Bay

Buffalo County
Mondovi

Burnett County
None

Calumet County
None

Chippewa County
Chippewa Falls
Stanley

Clark County
Abbotsford
Loyal
Neillsville
Thorp

Columbia County
Columbus
Kilbourn
Portage

Crawford County
Prairie du Chien

Dane County
Belleville
Madison
Mazomanie
Stoughton
Sun Prairie
Token Creek

Dodge County
Beaver Dam
Horicon
Mayville
Randolph

Door County
Sturgeon Bay

Douglas County
Superior

Dunn County
Colfax
Menomonie

Eau Claire County
Eau Claire
Fairchild

Florence County
None

Fond du Lac County
Fond du Lac

Fond du Lac County—Con.
North Fond du Lac
Oakfield
Ripon
Waupun

Forest County
None

Grant County
Boscobel
Lancaster
Platteville

Green County
Brodhead
Monroe

Green Lake County
Berlin

Iowa County
Avoca
Dodgeville
Mineral Point

Iron County
None

Jackson County
Black River Falls

Jefferson County
Ft. Atkinson
Jefferson
Johnson Creek
Lake Mills
Waterloo
Watertown

Juneau County
Elroy

Kenosha County
Kenosha

Kewaunee County
Algoma
Kewaunee

La Crosse County
La Crosse

La Fayette County
Darlington

Langlade County
Antigo

Lincoln County
Merrill

Manitowoc County
Manitowoc
Two Rivers

Marathon County
Colby
Mosinee
Wausau

Marinette County
Marinette
Peshtigo
Wausaukee

Marquette County
None

Milwaukee County
East Milwaukee
Milwaukee
North Milwaukee
South Milwaukee
Wauwatosa
West Allis

Monroe County
Sparta
Tomah

Oconto County
Oconto
Oconto Falls

Oneida County
Rhinelander

Outagamie County
Appleton
Hortonville
Kaukauna
Seymour
Shiocton

Ozaukee County
Pt. Washington

Pepin County
Durand

Pierce County
Prescott

Polk County
None

Portage County
Stevens Point

Price County
Park Falls
Phillips

Racine County
Burlington
Racine

Richland County
Lone Rock
Richland Center

Rock County
Beloit
Edgerton
Evansville
Footville
Janesville
Milton Junction
Orfordville

Rusk County
Ladysmith

St. Croix County
Glenwood
Hudson
New Richmond

Sauk County
Baraboo
Ironton
La Valle
North Freedom
Prairie du Sac
Reedsburg
Spring Green

Statistics of Libraries

COUNTIES IN WHICH LIBRARIES ARE LOCATED—continued

Sawyer County
Hayward

Shawano County
Shawano

Sheboygan County
Cedar Grove
Elkhart
Glenbeulah
Oostburg
Plymouth
Sheboygan

Taylor County
Medford
Rib Lake

Trempealeau County
Arcadia
Eleva
Independence
Whitehall

Vernon County
Hillsboro
Viroqua
Westby

Vilas County
None

Walworth County
Delavan
Elkhorn
Genoa Junction
Lake Geneva
Whitewater
Williams Bay

Washburn County
Shell Lake

Washington County
Hartford
West Bend

Waukesha County
Delafield
Hartland
Menomonee Falls
Oconomowoc
Pewaukee
Waukesha

Waupaca County
Clintonville
New London
Waupaca

Waushara County
None

Winnebago County
Menasha
Neenah
Omro
Oshkosh

Wood County
Grand Rapids
Marshfield

PUBLIC LIBRARIES OF WISCONSIN

June 30, 1908

Abbotsford. Population 893
Public library—Sarah Hanson, librarian; W. S. Bailey, president and chairman of book committee; M. W. DeLap, secretary
Located in city hall
Books—no. volumes 776; no. borrowers 373; annual circulation 5,333

Algoma. Population 2,008
Free public library

Antigo. Population 6,663
Free public library—Florence C. Farnham, librarian; F. J. Finucane, president and chairman of book committee; C. O. Marsh, secretary
Building—erected 1905, cost, $15,000; gift of Andrew Carnegie; A. D. Conover, Madison, architect
Books—no. volumes 3,667; no. borrowers 4,425; circulation 24,773

Appleton. Population 17,000
Free public library—Agnes L. Dwight, librarian; George C. Jones, president, F. S. Bradford, secretary; O. E. Clark, chairman of book committee
Building—erected 1900; cost, $40,000; gift of city; W. A. Holbrook, Milwaukee, and Herman Wildhagen, Appleton, architects
Books—no. volumes 10,520; no. borrowers 3,830; circulation 52,483

Arcadia. Population 1,316
Free public library—Louise Gasser, librarian; Emil Maurer, president; F. C. Richmond, secretary; Sophia J. Proctor, chairman of book committee.
Building—erected 1906; cost, $5,000; gift of Andrew Carnegie
Books—no. volumes 1,674; no. borrowers 858; circulation 5,336

Ashland. Population 14,519
Vaughn public library—Cecile M. Fennelly, librarian; S. S. Fifield, president; G. F. Merrill, secretary; C. A. Lamoreaux, chairman of book committee.
Located in business block, revenue from which supports library
Books—no. volumes 5,237; no. borrowers 3,264; circulation 21,461

Baraboo. Population 5,835
Free public library—Kate M. Potter, librarian; R. B. Griggs, president; S. L. Van Orden, secretary; Mrs. J. E. English, chairman of book committee
Building—erected 1903; cost $15,000, gift of Andrew Carnegie; Claude & Starck, Madison, architects
Books—no. volumes 6,943; no. borrowers 2,274; circulation 29,373.

Statistics of Libraries

Bayfield. Population 1,689
Carnegie library—Katherine Mussell, librarian; H. J. Wacksmuth, president; Theo. Wieland, secretary; H. P. Hale, chairman of book committee
Building—erected 1903, cost $10,000, gift of Andrew Carnegie; Henry Wildhagen, Ashland, architect
Books—no. volumes, 3,584; no. borrowers, 868; circulation, 4,767

Beaver Dam. Population 5,618
Williams free library—Hattte A. Doolittle, librarian; H. B. Hubbell, president and chairman of book committee; J. E. McClure, secretary
Building—erected 1891; cost $25,000, gift of J. J. Williams; E. T. Mix & Co., Milwaukee, architects
Books—no. volumes 8,076; no. borrowers 1,553; circulation 27,438

Belleville. Population 423
Free library—Mrs. Grace Knox, librarian; R. C. Oliver, president; J. W. DeWitt, secretar and chairman of book committee
Located in t wn hall
Books—no. volumes 2,195; no. borrowers 129; circulation 2,770

Beloit. Population 12,855
Public library—Martha W. Bell, librarian; F. N. Strong, president; G. B. Ingersoll, secretary; R. J. Burdge, chairman of book committee
Building—erected 1903; cost $25,000, gift of Andrew Carnegie; Patton & Miller, Chicago, architects
Books—no. volumes 11,350; no. borrowers 5,548; circulation 52,610

Berlin. Population 4,638
Public library—Margaret Biggert, librarian; Mrs. C. S. Morris, president and chairman of book committee; Miss FitzMaurice, secretary
Building—erected 1904; cost $10,000, gift of Andrew Carnegie; H. A. Foeller, Green Bay, architect
Books—no. volumes 3,989; no. borrowers 1,384; circulation 16,910

Black River Falls. Population 1,946
Free public library—Anna C. Wylie, librarian; J. H. Mills, president; Mrs. Lulu Cumnock, secretary; Mrs. C. J. Van Schaick, chairman of book committee
Located in ————
Books—no. volumes 2,062; no. borrowers 547; circulation 8,745

Brodhead. Population 1,667
Free public library—Winnie Bucklin, librarian; A. S. Moore, president and chairman book committee; W. H. Fleek, secretary
Located in city hall.
Books—no. volumes 1,520; no. borrowers 665; circulation, 9,254

Burlington. Population 2,625
Library association—Alma Neuhaus, librarian
Located in Business Men's club house

Chippewa Falls. Population 9,009
Public library—Mrs. Anna C. Bronsky, librarian; Dr. W. H. Bailey, president; J. A. Seydel, secretary; J. A. Anderson, chairman book committee
Building—erected 1901; cost, $20,000, gift of Andrew Carnegie; F. D. Orff, Minneapolis, architect
Books—no. volumes 8,350; no. borrowers 4,341; circulation 40,661

Clintonville. Population 1,837
Free library—Emeline Sedgwick, librarian; O. L. Olin, president; F. A. Sedgwick, president and chairman book committee
Located in city hall.
Books—no. volumes 828; no. borrowers 487; circulation 5,053

Colby. Population 584
Free public library—Mrs. Etta E. Grimes, librarian, secretary, and chairman book committee; E. V. Kautsky, president
Located in city hall
Books—no. volumes 800; no. borrowers 240; circulation 1,366

Colfax. Population 640
Free public library—A. R. Wildes, librarian
Located in bank building.
Books—no. volumes 229; no. borrowers 175; circulation 669

Statistics of Libraries

Columbus. Population 2,388
Free public library—Nellie A. Loomis, librarian; F. A. Chadbourn, president; H. J. Weidemann, secretary; Fred Thomson, chairman book committee
Located in city hall
Books—no. volumes 3,471; no. borrowers 1,171; circulation 18,298

Cumberland. Population 1,493
Free library—Mrs. G. E. Carr, librarian; Dr. W. B. Hopkins, president; Mrs. H. Pankey, secretary
Building—erected 1906; cost, $10,000; gift of Andrew Carnegie; C. H. Patsche, Fairmount, Minn. architect
Books—no. volumes 2,637; no. borrowers 670; circulation 9,704

Darlington. Population 1,843
Public library—Isabella Bird, librarian and secretary; P. A. Orton, president.
Building—erected 1905; cost $10,000, gift of Andrew Carnegie; Claude & Starck Madison, architects
Books—no. volumes 3,813; no. borrowers 1,016; circulation 12,410

Delafield. Population 632
Public library—Laura Lidicker, librarian; L. R. Whitney, secretary.
Located in city hall
Books—no. volumes 693; no. borrowers 210; circulation 491

Delavan. Population 2,321
Aram public library—Laura F. Angell, librarian; A. H. Allyn, president; S. C. Wadmund, secretary; W. A. Cochrane, chairman book committee
Building—erected 1907; cost $20,000; gift of James Aram and citizens; Claude & Starck, Madison, architects
Books—no. volumes 2,332

Depere. Population 4,523
Public library—Helen S. Mathews, librarian; M. J. Maes, president; Elizabeth Smith, secretary; L. L. Tessier, chairman book committee
Located in city hall
Books—no. volumes 4,443; no. borrowers 1,116; circulation 20,376

Dodgeville. Population 2,152
Public library—Mrs. R. Lane, librarian; W. H. Thomas, president; T. M. Strong secretary; Mrs. T. B. Davis, chairman book committee
Located in city hall
Books—no. volumes, 1,317; circulation, 5,717.

Durand. Population 1,359
Free library—Mrs. E. M. Dunlop, librarian; D. E. Kiser, president; Mrs. A. A. Peck, secretary; S. B. Tarrant, chairman book committee
Building—erected 1907; cost $7,500, gift of Andrew Carnegie; Claude & Starck, Madison, architects
Books—no. volumes 2,172; no. borrowers 614; circulation 8,720.

East Milwaukee. Population 473
Free public library—Julia E. Olson, librarian; T. B. Olson, president; Paul Hahn, secretary; Emil Weiskardt, chairman book committee
Located in schoolhouse
Books—no. volumes 247; no. borrowers 58; circulation 301.

Eau Claire. Population 18,737
Public library—Mary A. Smith, librarian; L. A. Doolittle, president; A. Cypreansen, secretary; W. H. Schultz, chairman book committee
Building—erected 1904; cost $40,000, gift of Andrew Carnegie; Patton & Miller, Chicago, architects
Books—no. volumes 17,852; no. borrowers 6,604; circulation 56,200.

Edgerton. Population 2,416
Public library—Leora Mabbett, librarian; L. E. Gettle, president; Mrs. E. L. Roethe, secretary; Mrs. E. C. Hopkins, chairman book committee
Building—erected 1906; cost $10,000, gift of Andrew Carnegie; Henry Foeller, Green Bay, architect
Books—no. volumes 2,844; no. borrowers 1,533; circulation 16,475.

Elkhart Lake. Population 462
Free library—George Gerhard, librarian; G. W. Wolff, president; W. P. Schwartz, secretary; W. A. Dornbusch, chairman book committee
Located ————
Books—no. volumes 222; no. borrowers 225

Statistics of Libraries

Elkhorn. Population 1,818
Charles E. Sprague free library—Edna L. Derthick, librarian; Jay F. Lyon, president; A. C. Beckwith, secretary
Located in city hall
Books—no. volumes 3,952; no. borrowers 575; circulation 8,214

Elroy. Population 2,011
Public library—Edna L. Roberts, librarian; J. E. Hart, president; A. F. Fields, secretary; Mrs. M. E. Smith, chairman book committee
Building—erected 1907; cost $10,000, gift of Andrew Carnegie; Claude & Starck, Madison, architects
Books—no. volumes 1,395; no. borrowers 628; circulation 5,694

Evansville. Population 1,963
Eager Free public library—Mrs. Hattie J. Boyd, librarian; A. S. Baker, president; Gertrude Eager, secretary; Mrs. Carrie Porter, chairman book committee
Building—erected 1907; cost $10,000, gift of Almon Eager; Claude & Starck, Madison, architects
Books—no. volumes 2,947; no. borrowers 1,071; circulation 14,626

Fairchild. Population 806
Public library—Mrs. L. W. Foster, librarian and secretary; W. F. Herbst, president; F. W. Herbst, chairman book committee
Located in city hall
Books—no. volumes 386; no. borrowers 200; circulation 2,269

Fond du Lac. Population 17,284
Public library—Emma E. Rose, librarian; John Heath, president; William Wilson, secretary; G. T. McDougall, chairman book committee
Building—erected 1904; cost $30,000, gift of Andrew Carnegie; Van Ryn & DeGelleke, Milwaukee, architects
Books—no. volumes 24,364; no. borrowers 4,146; circulation 54,769

Fort Atkinson. Population 3,300
Public library—Sue C. Nichols, librarian; A. M. Webb, president; Mrs. C. A. Caswell, secretary and chairman book committee
Located in store building
Books—no. volumes 3,446; no. borrowers 693; circulation 11,541

Genoa Junction. Population 710
Free public library—Mrs. Carrie L. Manor, librarian; Mrs. George Robinson, president; Mrs. Charles Ford, secretary; Mrs. C. A. Swenson, chairman book committee
Located in clothing store
Books—no. volumes 851; no. borrowers 427; circulation 3,695

Glenbeulah. Population ——
Library and literary association—Mrs. Hattie L. Huntley, librarian
Located in basement of amusement hall owned by local library association
Books—no. volumes 718; circulation 50

Grand Rapids. Population 6,157
T. B. Scott free public library—Edith L. Rablin, librarian; F. T. Wood, president; Mrs. J. E. Daly, secretary; J. A. Gaynor, chairman book committee
Located in city hall
Books—no. volumes 6,222; no. borrowers 2,391; circulation 25,189

Green Bay. Population 22,854
Kellogg public library—Deborah B. Martin, librarian; S. D. Hastings, president and chairman of book committee; H. W. Sims, secretary
Building—erected 1902; cost $30,000, gift of Andrew Carnegie; H. A. Foeller, Green Bay, architect
Books—no. volumes 14,517; no. borrowers 5,526; circulation 58,552

Hartford. Population 2,052
Free public library—H. Juno Goetz, librarian; G. E. Ives, president; Hattie M. Amidon, secretary; Otto Wollner, chairman book committee
Located in city hall
Books—no. volumes 1,007; no. borrowers 837; circulation 9,902

Hartland—Population 673
Free public library—Mabel V. Hansen, librarian; Mrs. H. G. B. Nixon, president; Mrs. A. B. Chamberlain, secretary; Mrs. Bergnall, chairman book committee
Located in printing office.
Books—no. volumes 1,024; no. borrowers 363; circulation 1,909

Statistics of Libraries

Hayward. Population 2,900
Carnegie free library—Clarence O. Bayo, librarian; D. S. Peck, president; A. F. Nichols, secretary: J. B. Trowbridge, chairman book committee
Building—erected 1904; cost $10,000, gift Andrew Carnegie; Henry Wildhagen, Ashland, architect
Books—no. volumes 3,807; no. borrowers 903; circulation 14,121

Hillsboro. Population 804
Public library—R. Lind, librarian; E. V. Wernick, secretary
Located in jewelry store
Books—no. volumes 1,064; no. borrowers 400; circulation 2,136

Horicon. Population 1,553
Free public library—Frances Zedler, librarian; Mrs. L. Hanson, pr esident; F. Forbes, secretary
Located in bank building
Books—no. volumes 1,429; no. borrowers 415; circulation 3,219

Hortonville. Population 890
Public library—Anna Ritger, librarian
Located in printing office
Books—no. volumes 409; no. borrowers 452; circulation 2,943

Hudson. Population 3,220
Public library—Pearl G. Shoemaker, librarian; George Cline, president; J. Hochstein, secretary. James Andrews, chairman book committee
Building—erected 1904; cost $12,000, gift of Andrew Carnegie; Van Ryn & De Gelleke, Milwaukee, architects
Books—no. volumes 3,377; no. borrowers 1,668; circulation 20,946

Independence. Population 663
Public library—Mrs. Minnie Cole, librarian; G. A. Markham, president; C. F. Peterson, secretary and chairman book committee
Located in city hall.
Books—no. volumes 666; no. borrowers 180; circulation 2,279

Ironton. Population 1,270
Public library—Mrs. J. R. Fitzgerald, librarian
Located in drug store
Books—no. volumes 300; no. borrowers 200

Janesville. Population 13,770
Public library—Gertrude Skavlem, librarian and secretary; William Bladon, president; H. C. Buell, chairman book committee
Building—erected 1903; cost $40,000, gift of Andrew Carnegie ($30,000) and F. E. Eldred ($10,000); J. W. T. Jennings, Madison, architect
Books—no. volumes 20,242; no. borrowers 6,765; circulation 66.000

Johnson Creek. Population 494
Public library—Mrs. A. E. Greenwood, librarian; H. J. Grell, president; J. P. Denneth, secretary; A. E. Greenwood, chairman book committee
Located in furniture store
Books—no. volumes 383; no. borrowers 229; circulation 383

Kaukauna. Population 4,991
Free public library—Lillian E. Bell, librarian; H. J. Mulholland, president; Mrs. Elizabeth Dayton, secretary; F. M. Charlesworth, chairman book committee
Building—erected 1905; cost $12,000, gift of Andrew Carnegie; Claude & Starck, Madison, architect
Books—no. volumes 3,793; no. borrowers 1,916; circulation 18,466

Kenosha. Population 16,235
Gilbert M. Simmons library—Mrs. Clara P. Barnes, librarian; W. W. Strong, president; E. C. Thiers, secretary; James Cavanagh, chairman book committee
Building—erected 1900; cost $150,000, gift of Z. G. Simmons; D. H. Burnham, Chicago, architect
Books—no. volumes 18,302; no. borrowers 5,720; circulation 80,476

Kewaunee. Population 1,719
Free public library—Marie Brunckhorst, librarian; F. Poser, president; Mr. Brunckhorst, secretary and chairman book committee
Located in bank building
Books—no. volumes 1,696; no. borrowers 629; circulation 15,043

Statistics of Libraries

Kilbourn. Population 1,091
Public library—Lillian F. Ramsey, librarian; C. W. Snider, president and chairman book committee; Mary Conway, secretary
Building—residence bought and used as library; cost $1,500, raised by subscription
Books—no. volumes 2,938; no. borrowers 1,866; circulation 13,591

La Crosse. Population 29,078
Public library—Mary A. Smith, librarian; W. A. Anderson, president; J. M. Holly, secretary; G. M. Woodward, chairman book committee
Building—erected, 1888; cost, $19,500; gift of C. C. Washburn; C. C. Yost, Minneapolis, architect. Addition being built
Books—no. volumes 16,865; no. borrowers 11,303; circulation 82,259

Ladysmith. Population
Public library—Isabel Conklin, librarian; C. J. McCormack, president; F. O. Monroe, secretary; Thomas Barker, chairman book committee
Building—erected 1907; cost, $10,000. gift of Andrew Carnegie; Claude & Starck, Madison, architect
Books—no. volumes 690; no. borrowers, 705

Lake Geneva. Population 3,449
Public library—Gertrude J. Noyes, librarian; Mrs. E. M. Smith, president; A. M. Kaye, secretary; Mrs. R. B. Arnold, chairman book committee
Building—residence, gift of Mrs. George Sturges
Books—no. volumes 4,179; no. borrowers 1,780; circulation 12,823

Lake Mills. Population 1,620
L. D. Fargo, library—Clara M. Mosher, librarian and chairman book committee: F. B. Fargo, president: Conrad Engsberg, secretary.
Building—erected 1902; cost $10,000, gift of L. D. Fargo; Ferry & Clas, Milwaukee, architects.
Books—no. volumes 2,859; no. borrowers 870; circulation 8,952

Lancaster. Population 2,555
Public library—Bessie McNair, librarian: E. B. Goodsell, president; Emma Schreiner, secretary; G. B. Clementson, chairman book committee
Located in business block
Books—no. volumes 2,388; borrowers 995; circulation 10,765

La Valle. Population 350
Public library association—Nellie Godden, librarian; Mrs. H. E. Paddock, president; Mrs. Miller, secretary; Mrs. Sophia Borchers, chairman book committee
Located in rented rooms
Books—no. volumes 757; no. borrowers 379; circulation 2,657

Lone Rock. Population 604
Public library—Mrs. M. B. Shannon, librarian
Located in business block
Books—no. volumes 700: no. borrowers 100; circulation 1,500

Madison. Population 24,301
Free library—Julia A. Hopkins, librarian; E. A. Birge, president and chairman book committee; E. O. Kney, secretary
Building—erected 1905; cost, $75,000, gift of Andrew Carnegie; Frank Miles Day & Brother, Philadelphia, architects
Books—no. volumes 20,125; no. borrowers 11,747; circulation 79,501

Manitowoc. Population 12,733
Public library—Agnes J. Petersen, librarian; L. J. Nash, president; Flora Waldo, secretary; Mrs. E. M. Anderson, chairman book committee
Building—erected 1904; cost, $25,000, gift of Andrew Carnegie; VanRyn & DeGelleke, Milwaukee, architects
Books—no. volumes 8,683; no. borrowers 3,430; circulation 45,187.

Marinette. Population 15,354
Stephenson public library—Anna S. Pinkum, librarian; R. F. Goodman, president; L. S. Patrick, secretary; Mrs. C. E. Nichols, chairman book committee
Building—erected 1903; cost $33,769, including site, gift of Isaac Stephenson; Patton & Miller, Chicago, architects
Books—no. volumes 13,540; no. borrowers 4,729; circulation 51,731

Marshfield. Population 6,035
Free library—H. Della Ellinwood, librarian; W. D. Connor, president; Mrs. M. B. Cracraft, secretary; Dr. K. W. Doege, chairman book committee
Located in city hall
Books—no. volumes 5,360; no. borrowers 1,845; circulation 21,185

Statistics of Libraries

Mayville. Population 1,793
Public library—Etta Barrott, librarian; C. W. Peake, president; Olga Dreger, secretary; Anna Naber, chairman book committee
Located in business block
Books—no. volumes 1,001; no. borrowers 610; circulation 5,019

Mazomanie. Population 863
Free public library—Edna B. Woolrich, librarian.
Located in city hall
Books—no. volumes 582; no. borrowers 375; circulation 3,992

Medford. Population 1,923
Free public library—S. W. Ingham, librarian; Dr. E. LeSage, president; Margaret Ryan, secretary; A. J. Latton, chairman book committee
Located in building furnished by W. C. T. U
Books—no. volumes 2,262; no. borrowers 1,521; circulation 9,160

Menasha. Population 5,960
Elisha D. Smith library—Lucy L. Pleasants, librarian and chairman book committee; F. D. Lake, president; W. H. Meuer, secretary
Building—erected 1898; cost $25,000, gift of E. D. Smith; VanRyn & DeGelleke, Milwaukee, architects
Books—no. volumes 7,360; no. borrowers 1,534; circulation 25,461

Menomonee Falls. Population 936
Public library—Maude B. Schlafer, librarian
Books—no. volumes, 210; no. borrowers 321

Menomonie. Population 5,473
Tainter Memorial free library—Stella Lucas, librarian; C. E. Freeman, president and secretary
Building—erected 1891; cost $95,000, gift of Capt. and Mrs. Andrew Tainter; library occupies only portion of building; Buffington, Minneapolis, architect
Books—no. volumes 12,507; no. borrowers 2,376; circulation 47,855

Merrill. Population 9,197
T. B. Scott free library—Helen L. Price, librarian; G. J. Roberts, chairman book committee
Located in city hall
Books—no. volumes 11,708; no. borrowers 1,855; circulation 23,279

Milton Junction. Population 500
Free public library—Mrs. W. E. Sowle, librarian and chairman book committee; Dr. A. S. Maxson, president; Mrs. A. B. West, secretary
Located in bakery
Books—no. volumes 210; no. borrowers 189

Milwaukee. Population 312,948
Public library—G. W. Peckham, librarian and secretary; J. M. Pereles, president
Building—erected 1898; cost $500,000, raised by taxation Ferry & Clas, Milwaukee, architects
Books—no. volumes 181,597; no. borrowers 190,570; circulation 697,566

Mineral Point. Population 3,252
Public library—Margaret A. Crawford, librarian; Mrs. M. Chase, president and chairman book committee; Miss M. R. Grundy, secretary
Located in store building
Books—no. volumes 4,774; no. borrowers 818; circulation 12,146

Mondovi. Population 1,450
Free public library—Jennie Lovejoy, librarian; W. T. Ream, president; Mrs. R. Southworth, secretary; Alex. Lees, chairman book committee
Located in city hall
Books—no. volumes 1,748; no. borrowers 1,117; circulation 10,100

Monroe. Population 4,269
Arabut Ludlow Memorial library—Katherine A. Smock, librarian; J. L. Sherron, president
Building—erected 1905; cost $13,930, gift of H., E. and W. Ludlow; Claude & Starck Madison, architects
Books—no. volumes 6,450; no. borrowers 1,957; circulation 25,902

Statistics of Libraries

Mosinee. Population 530
Joseph Dessert public library—Nellie E. Scholes, librarian; A. von Berg, president; Wenzel Pivernetz, secretary; Mrs. Louis Dessert, chairman book committee
Building—erected 1899; cost $10,000, gift of Joseph Dessert; A. C. Eschweiler, Milwaukee, architect
Books—no. volumes 1,970; no. borrowers 400; circulation 5,329

Neenah. Population 6,047
Public library—Cora I. Lansing, librarian; L. H. Freeman, president; T. B. Blair, secretary; E. M. Beeman, chairman book committee
Building—erected 1904; cost $28,000, gift of Andrew Carnegie ($12,500), subscription ($15,500); VanRyn & DeGelleke, Milwaukee, architects
Books—no. volumes 10,808; no. borrowers 2,562; circulation 30,925

Neillsville. Population 2,117
Free library—Mame Woodward, librarian; Mrs. L. B. Ring, president; C. F. Grow, secretary and chairman book committee
Located in city hall
Books—no. volumes 2,823; no. borrowers 2,319; circulation 10,104

New London. Population 3,002
Public library—Jennie Radkey, librarian; G. T. Dawley, president; Mrs. F. Ci[illegible]ering, secretary and chairman book committee
Located in city hall
Books—no. volumes 2,025; no. borrowers 1,091; circulation 9,525

New Richmond. Population 1,824
Public library—Anna H. Epley, librarian; Mrs. A. Deneen, president; Mrs. D. Kibbe, secretary; C. J. Brewer, chairman book committee
Located in city hall
Books—no. volumes 1,801; no. borrowers 838; circulation 8,045

North Freedom. Population 578
Public library—Alice McCoy, librarian; M. J. Carpenter, president; Anna Donaghey, secretary; Mrs. Gertrude Hackett, chairman book committee
Located in rented room
Books—no. volumes 602; no. borrowers 274; circolation 3,188

North Milwaukee. Population 1,236
Free public library—Annie G. Godfrey, librarian; E. D. Coddington, president; Mrs. E. J. Henning, secretary; F. E. Morrow, chairman book committee
Located in city hall
Books—no. volumes 1,370 no. borrowers 642; circulation 5,750

Oakfield. Population 548
Public library—Katie E. Orvis, librarian; J. W. Burns, president and chairman book committee; Jessie Hoag, secretary
Located in rented building
Books—no. volumes 1,135; no. borrowers 307; circulation 3,728

Oconomowoc. Population 3,013
Free public library—Jennie C. Walther, librarian; Mary E. Fay, president; Addie E. Kern, secretary; J. Kate Collins, chairman book committee
Building—purchased by subscription; cost $4,500; gift Mrs. P. A. Valentine, Mrs. George Bullen and Mr. P. D. Armour, Sr., $1,500 each
Books—no. volumes 4,905; no. borrowers 912; circulation 10,281

Oconto. Population 5'722
Farnsworth public library—Gabriella Ackley, librarian; A. O. Ellis, president; G. F. Loomis, secretary
Building—erected 1903; cost $15.000, gift of George Farnsworth; H. A. Foeller, Green Bay, architect
Books—no. volumes 6,018; no. borrowers 3,364; circulation 37,357

Oconto Falls. Population 1,301
Free public library—Mrs. Maggie Digan, librarian; Mrs. W. C. Mead, president; Dr. H. M. Weed, secretary
Located in bank building
Books—no. volumes 670; no. borrowers 382; circulation 3,414

Omro. Population 1,304
Free public library—John S. Shelp, librarian; C. H. Larrabee, president and chairman book committee; S. Leighton, secretary
Located in city hall
Books—no. volumes 663; no. borrowers 320; circulation 4,541

Statistics of Libraries

Orfordville. Population 439
Public library—Betty Rostad, librarian; Charles Taylor, president; Ella Thoen, secretary
Located in city hall
Books—no. volumes 460; no. borrowers 172; circulation 639

Oshkosh. Population 30,575
Public library—Maud Durlin, librarian; C. D. Cleveland, president; J. H. Jenkins secretary: G. A. Buckstaff, chairman book committee
Building—erected 1900; cost, $56,500, gift Marshall Harris and Philetus Sawyer; William Walters, Oshkosh, architect
Books—no. volumes 20,414; no. borrowers 7,654; circulation 92,393

Park Falls. Population 1,438
Public library—Elsie Eckardt, librarian; Cecil L. Paquin, president; Clara E. Gibson, secretary; Prof. Kneip, chairman book committee
Located in rented building
Books—no. volumes 399; no. borrowers 360

Peshtigo. Population 2,539
Public library—Mrs. Ed. Gilson, librarian; R. C. Ramsay, president and chairman book committee; W. T. Dolan, secretary
Located in store building
Books—no. volumes 491; no. borrowers 938; circulation 10,559

Pewaukee. Population 763
Public library—volunteer librarian; Dr. M. Welton, president; Kate Clark, secretary; Mrs. M. Welton, chairman book committee
Located in business block
Books—no. volumes 1,814; no. borrowers 672; circulation 4,080

Platteville. Population 4,438
Public library—Maude E. Guernsey, librarian; Mrs. H. G. Chase, president; Mrs. Ella Huntington, secretary; Mrs. J. W. Livingston, chairman book committee
Located in business block
Books—no. volumes 1,963; no. borrowers 1,839; circulation 17,461

Plymouth. Population 2,764
Public library—Grace Prescott, librarian; G. W. Zerler, president; Mary L. Clark, secretary: Mrs. M. C. Mead, chairman book committee
Located in rented rooms
Books—no. volumes 2,819; no. borrowers 1,186; circulation 15'522

Portage. Population 5,524
Free public library—Mrs. W. G. Clough, librarian; Dr. A. C. Kellogg, president; Mrs. R. B. Wentworth, secretary; W. G. Clough, chairman book committee
Located in city hall
Books—no. volumes 7,886; no. borrowers 3,093; circulation 32,504

Port Washington. Population 4,036
Public library—C. F. Eckel, librarian
Located in jewelry store
Books—no. volumes 600; no. borrowers 329

Prairie du Sac. Population 671
Free public library—Ruth Accola, librarian and secretary; J. S. Tripp, president; R. S. Babington, chairman book committee
Located in city hall
Books—no. volumes 654; no. borrowers 350; circulation 3,316

Prescott. Population 889
Free public library—Barbara Firner, librarian, James Goldsworthy, president; Ruth Walker, secretary; Mrs. H. G. Buschman, chairman book committee
Located in city hall
Books—no. volumes 800; no. borrowers 324; circulation 426

Racine. Population 32,290
Public library—Mary J. Calkins, librarian; C. H. Lee, president; James Craig, secretary; Sarah M. Morrison, chairman book committee
Building—erected 1903; cost $50,000, gift of Andrew Carnegie; Mauran, Russell & Garden, St. Louis, architects
Books—no. volumes 15,550; no. borrowers 7,522; circulation 105,759

Statistics of Libraries

Randolph. Population 818
Public library—Mrs. Jennie Davis, librarian; C. E. Hutchinson, president; M. R. Jones, secretary
Located in millinery store
Books—no. borrowers 281

Reedsburg. Population 2,515
Public library—Mrs. N. A. Cushman, librarian; J. H. Hosler, president; Mrs. W. H. Ramsey, secretary; M. Riggert, chairman book committee
Located in city hall
Books—no. volumes 3,093; no. borrowers 1,288; circulation 10,642

Rhinelander. Population 5,435
Public library—Ada J. McCarthy, librarian and secretary; J. S. Miller, president
Building—erected 1904; cost $15,000, gift of Andrew Carnegie; VanRyn & DeGelleke, Milwaukee, architects
Books—no. volumes 4,904; no. borrowers 2,299; circulation 22,675

Rib Lake. Population 1,122
Free public library—Anna M. Kennedy, librarian; Mr. Headstream, president; Mrs. L. Rousseau, sccretary; Mrs. E. C. Getchel, chairman book committee
Located in business block
Books—no. volumes 540; no. borrowers 325; circulation 2,561

Rice Lake. Population 3,410
Free public library—Mrs. James Robbins, librarian; W. H. Bundy, president; Mrs. M. T. Howard, secretary; Mrs. O. M. Sattre, chairman book committee
Building—erected 1905; cost $10,000, gift of Andrew Carnegie; Mr. Parkinson, Sparta, architect
Books—no. volumes 3,836; no. borrowers 1,366; circulation 18,353

Richland Center. Population 2,632
Free library—Vera Eastman, librarian; Mrs. J. G. Lamberson, president; O. J. Burnham, secretary
Building—erected 1905; cost $10,000, gift of Andrew Carnegie; Claude & Starck, Madison, architects
Books—no. volumes 3,036; no. borrowers 1,229; circulation 13,695

Ripon. Population 3,811
Public library—Blanche Thompson, librarian; W. S. Crowther, president and chairman book committee; H. J. Faustman, secretary
Building—erected 1906; cost $12,000, gift of Andrew Carnegie; Charles Anderson, Waukesha, architect
Books—no. volumes 4,991; no. borrowers 1,619; circulation 15,178

Seymour. Population 1,116
Publc library—Cora M. Lampson, librarian; A. J. Lotter, president; Mrs. E. J. Dean, secretary
Located in city hall
Books—no. volumes 796; no. borrowers 148; circulation 1,973

Shawano. Population 2,446
Public library—Lulu M. Roberts, librarian; L. D. Roberts, president; Mrs. C. W. Magee, secretary; E. J. Scott, chairman book committee
Located in city hall
Books—no. volumes 1,277; no. borrowers 1,426; circulation 6,813

Sheboygan. Population 24,026
Public library—Bertha Marx, librarian; Carl Zillier, president; Francis Williams, secretary and chairman book committee
Building—erected 1903; cost $35,000, gift of Andrew Carnegie; Patton & Miller, Chicago, architects
Books—no. volumes 8,967; no. borrowers 5,315; circulation 49,086

Shell Lake. Population 1,137
Public library—Helga Agren, librarian; Mrs. L. H. Mead, president; Mrs. J. M. Smith, secretary; E. R. Oliver, chairman book committee
Located in rented room
Books—no. volumes 560; no. borrowers 339; circulation 4,140

Shiocton Population 491
Public library—Dr. C. C. Tuckwood, librarian
Located in Dr. Tuckwood's office
Books—no. volumes 762; no. borrowers 478

Statistics of Libraries

South Milwaukee. Population 5,284
Free library—Max Hoffman, librarian
Located in tailor shop
Books—no. volumes 400; no. borrowers 280

Sparta. Population 3,807
Free library—Jennie Scouten, librarian; G. A. Richardson, president; Mrs. Paul Schaller, secretary; Dr. F. P. Styles, chairman book committee
Building—erected 1903; cost $12,000, gift of Andrew Carnegie; Shick & Roth, La Crosse, architects
Books—no. volumes 6,334; no. borrowers 1,724; circulation 27,445

Spring Green. Population 770
Free public library—Bertha Schwanke, librarian; J. E. Morgan, president; T. W. King, secretary; Emma Evans, chairman book committee
Located in city hall
Books—no. volumes 637; no. borrowers 276; circulation 2,413

Stanley. Population 2,722
Free public library—Martha E. Dunn, librarian and secretary; G. H. Chapman, president; Dr. E. F. Burns, chairman book committee
Building—erected 1901; cost $15,000, gift of Mrs. Sallie F. Moon
Books—no. volumes 2,780; no. borrowers 1,363; circulation 12,146

Stevens Point. Population 9,022
Public library—Mollie Catlin, librarian; B. B. Park, president; Mrs. R. A. Cook, secretary; A. H. Sanford, chairman book committee
Building—erected 1904; cost $21,000, gift of Andrew Carnegie; Henry Foeller, Green Bay, architect
Books—no. volumes 6,498; no. borrowers 5,401; circulation 70,501

Stoughton. Population 4,244
Free public library—Amanda Drotning, librarian; E. Drotning, president; Mrs. Terry, secretary and chairman book committee
Building—erected 1906; cost $13,000, gift of Adnrew Carnegie; Claude & Starck, Madison, architects
Books—no. volumes 3,126; no. borrowers 2,048; circulation 22,576

Sturgeon Bay. Population 4,640
Public library—Eva Greisen, librarian; Charles Greisen, president; Mrs. Packard, secretary; C. G. Stangel, chairman book committee
Located in postoffice building
Books—no. volumes 1,560; no. borrowers 1,145; circulation 15,373

Sun Prairie. Population 1,086
Free public library—Grace M. Rood, librarian: Mrs. W. T. Mann, president; Fannie Carlton, secretary
Located in city hall
Books—no volumes 697; no. borrowers 314; circulation 3,211

Superior. Population 36,551
Public library—Ethel F. McCollough, librarian: C. H. Sunderland, president; H. N. Rasmussen, secretary; Mrs. H. H. Rogers, chairman book committee
Building—erected 1902; cost, $50,000: gift of Andrew Carnegie: Carl Wirth, Superior, architect
Books—no. volumes 18,006; no. borrowers 9,129; circulation, 88,283

Thorp. Population 878
Public library—Mary Phillips, librarian; W. S. Parks, president; R. H. Tolford, secretary; G. H. Lusk, chairman book committee
Building—gift of Mr. Lusk (old building remodeled)
Books—no. volumes 1,291; no. borrowers 500; circulation 5,945

Token Creek.
Free library—Mary F. Connor, librarian
Located in private house
Books—no. volumes 250; no. borrowers 15

Tomah. Population 3,008
Public library—Caroline W. D. Voswinkel, librarian; Rev. Louis Wurst, president; Rev. J. G. Smith, secretary; W. E. Nuzum, chairman book committee
Located in city building
Books—no. volumes 2,839; no. borrowers 1,366; circulation 17,674

Statistics of Libraries

Two Rivers. Population 4,602
Joseph Mann public library—Lizzie G. Baetz, librarian; Mrs. J. E. Hamilton, president; J. F. Magee, secretary; W. J. Hamilton, chairman book committee.
Building—erected 1891; cost $4,000, gift of Mrs. Joseph Mann ($1,000), citizens ($3,000)
Books—no. volumes 3,886; no. borrowers 576; circulation 14,560.

Viroqua. Population 2,032
Public library—Clara A. Glenn, librarian; H. P. Proctor, president; Lucy R. Dawson, secretary and chairman book committee
Building—erected 1905; cost $10,000, gift of Andrew Carnegie; Claude & Starck, Madison, architects
Books—no. volumes, 3,313; no. borrowers 1,027; circulation 12,954

Washburn. Population 4,924
Free public library—May M. Greenwood, librarian; N. M. Oscar, president; E. Bryan, secretary; W. H. Irish, chairman book committee
Building—erected 1905; cost $18,000; gift of Andrew Carnegie; Henry Wildhagen, Ashland, architect
Books—no. volumes, 4,570; no. borrowers 1,550; circulation 22,623

Waterloo. Population 1,105
Public library—Emily Hyer, librarian; P. E. Hoag, president; Mrs. L. Lewellin, secretary; Mrs. B. F. Ivins, chairman book committee
Located in rented room, business block
Books—no. volumes 982; no. borrowers 371

Watertown. Population 8,622
Free public library—Maud R. Macpherson, librarian; J. H. Ott, president; H. T. Eberle, secretary; J. W. Wiggenhorn, chairman book committee
Building—erected 1907; cost $20,000, gift of Andrew Carnegie; Claude & Starck, Madison, architects
Books—no. volumes 5,312; no. borrowers 3,300; circulation 35,372

Waukesha. Population 6,949
Free public library—Fannie L. Ells, librarian; D. J. Hemlock, president; Mrs. Lora McDonald, secretary; Ida T. Ray, chairman book committee
Building—erected 1903; cost $15,000, gift of Andrew Carnegie; Charles Anderson, Waukesha, architect
Books—no. volumes 6,072; no. borrowers, 3,430; circulation 27,800

Waupaca. Population 2,873
Free public library—Winnifred Bailey, librarian; Mrs. Amy Roberts, president; William Dressen, secretary; Mrs. E. E. Browne, chairman book committee
Located in business block
Books—no. volumes 3,252; no. borrowers, 1,380; circulation 15,029

Waupun. Population 3,000
Public library—Kathryn L. Bunker, librarian; E. A. Shaler, president; B. W Davis, secretary and chairman book committee
Building—erected 1905; cost $10,000, gift of Andrew Carnegie; H. A. Foeller, Green Bay, architect
Books—no. volumes, 6,113; no. borrowers 1,330; circulation 16,614

Wausau. Population 14,458
Public lib.ary—Katherine Cramer, librarian; Louis Marchetti, president; Mrs. Mary Dickens, secretary; S. B. Tobey, chairman book committee
Building—erected 1907; cost $25,000, gift of Andrew Carnegie; W. G. Maher, Chicago, architect
Books—no. volumes 5,130; no. borrowers 3,073; circulation 50,955

Wausaukee. Population 1,729
Free library—Ethlyn M. Gray, librarian and secretary; H. P. Bird, president; R. B. Thiel, chairman book committee
Building—erected 1902; cost $4,000, gift of H. P. Bird; Mr. Brooks, Chicago, architect
Books—no. volumes 1,538; no. borrowers 340; circulation 10,005

Wauwatosa. Population 2,913
Public library—Mrs. Agnes B. Roddis, librarian; A. W. Smith, president; J. O. Myers, secretary; Mrs. R. Dewey, chairman book committee
Building—erected 1892; cost $5,000, gift of citizens; addition built 1906; cost $6,000. gift of Andrew Carnegie
Books—no. volumes 5,212; no. borrowers 837; circulation 11,974

Statistics of Libraries

West Allis. Population 2,309
Library association—Chester Shaw, librarian
Building—unused schoolhouse
Books—no. volumes 500; no. borrowers 315

West Bend. Population 2,362
Public library—Anna M. Klumb, librarian; Mrs. S. F. Mayer, president; C. P. Mooers, secretary; Mrs. G. A. Heidner, chairman book committee.
Located in city hall
Books—no. volumes 2,593; no. borrowers 959; circulation 9,577

Westby. Population 767
Public library—Agnes Lien, librarian
Located in Temperance hall
Books—no. volumes 524; no. borrowers 480

Whitehall. Population 700
Free library—Mrs. O. Rogan, librarian; J. O. Melby, president; Emma D. Solsrud, secretary; O. K. Ramberg, chairman book committee
Building—erected 1899; cost $524, gift of citizens; C. Maybury, architect
Books—no. volumes 1,898; no. borrowers 800; circulation 5,351

Whitewater. Population 3,108
Public library—Ella A. Hamilton, librarian; C. M. Blackburn, president; Ole Olsen, secretary; A. A. Upham, chairman book committee
Building—erected 1904; cost $12,000, gift of Flavia White; Claude & Starck, Madison architects
Books—no. volumes 5,780; no. borrowers 3,328; circulation 23,419